SECTION 4.0

SAMPLE SUMMARY TABLES IN BRANCH TECHNICAL POSITION FORMAT

4.0 SAMPLE SUMMARY TABLES IN BRANCH TECHNICAL POSITION FORMAT

All sample data is summarized in table form. The tables are titled "Radiological Environmental Monitoring Program Annual Summary" and use the following format as specified in the NRC Branch Technical Position:

Column

1. Sample medium

2. Type and number of analyses performed

3. Required Lower Limits of Detection (LLD), see Section 3.8, Table 3.8-1. This wording indicates that inclusive data is based on 4.66 S_b (sigma) of background (See Section 3.7).

4. The mean and range of the positive measured values of the indicator locations.

5. The mean, range, and location of the highest indicator annual mean. Location designations are keyed to Table 3.3-1 in Section 3.3.

6. The mean and range of the positive measured values of the control locations.

7. The number of nonroutine reports sent to the Nuclear Regulatory Commission.

NOTE: Only positive measured values are used in statistical calculations.

TABLE 4.0-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220
NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410
OSWEGO COUNTY, STATE OF NEW YORK, JANUARY – DECEMBER 2002*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD(a)	INDICATOR LOCATIONS: MEAN (f) / RANGE	LOCATION (b) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN (f) / RANGE	CONTROL LOCATION: MEAN (f) / RANGE	NUMBER OF NONROUTINE REPORTS
Shoreline Sediment (pCi/kg-dry)	GSA (4):					
	Cs-134	150	<LLD	<LLD	<LLD	0
	Cs-137	180	49 (2/2) 45 – 53	No. 5: 49 (2/2) 1.5 at 80° 45 – 53	<LLD	0
Fish (pCi/kg-wet)	GSA (21): (h)					
	Mn-54	130	<LLD	<LLD	<LLD	0
	Fe-59	260	<LLD	<LLD	<LLD	0
	Co-58	130	<LLD	<LLD	<LLD	0
	Co-60	130	<LLD	<LLD	<LLD	0
	Zn-65	260	<LLD	<LLD	<LLD	0
	Cs-134	130	<LLD	<LLD	<LLD	0
	Cs-137	150	16 (1/14) 16 – 16	No. 2: 16 (1/7) 0.3 at 315° 16 – 16	<LLD	0

TABLE 4.0-1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220
NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410
OSWEGO COUNTY, STATE OF NEW YORK, JANUARY – DECEMBER 2002*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD(a)	INDICATOR LOCATIONS: MEAN (f) / RANGE	LOCATION (b) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN (f) / RANGE	CONTROL LOCATION: MEAN (f) / RANGE	NUMBER OF NONROUTINE REPORTS
Surface Water (pCi/liter)	H-3 (8):					
	H-3	3000(c)	297 (1/14) 297 - 297	No. 3: 297 (1/4) 0.6 at 55° 297 - 297	<LLD	0
	GSA (24):					
	Mn-54	15	<LLD	<LLD	<LLD	0
	Fe-59	30	<LLD	<LLD	<LLD	0
	Co-58	15	<LLD	<LLD	<LLD	0
	Co-60	15	<LLD	<LLD	<LLD	0
	Zn-65	30	<LLD	<LLD	<LLD	0
	Zr-95	15	<LLD	<LLD	<LLD	0
	Nb-95	15	<LLD	<LLD	<LLD	0
	I-131	15(c)	<LLD	<LLD	<LLD	0
	Cs-134	15	<LLD	<LLD	<LLD	0
	Cs-137	18	<LLD	<LLD	<LLD	0
	Ba/La-140	15	<LLD	<LLD	<LLD	0

TABLE 4.0-1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220
NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410
OSWEGO COUNTY, STATE OF NEW YORK, JANUARY – DECEMBER 2002*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD(a)	INDICATOR LOCATIONS: MEAN (f) / RANGE	LOCATION (b) OF HIIGHEST ANNUAL MEAN: LOCATION & MEAN (f) / RANGE	CONTROL LOCATION: MEAN (f) / RANGE	NUMBER OF NONROUTINE REPORTS
TLD (mrem per standard month)	Gamma Dose (127)	(d)	4.8 (119/119) (i) 3.1 – 9.4	TLD #85 (g): 8.6 (4/4) 0.2 at 294° 7.0 – 9.4	4.1 (8/8) 3.4 – 5.2	0
Air Particulates (pCi/m^3)	Gross Beta (260):	0.01	0.016 (208/208) 0.0058 – 0.0263	R-1 0.016 (52/52) 1.8 at 88° 0.007 – 0.026	0.0164 (52/52) 0.008 – 0.027	0
	I-131 (260):	0.07	<LLD	<LLD	<LLD	0
	GSA (60): Cs-134	0.05	<LLD	<LLD	<LLD	0
	Cs-137	0.06	<LLD	<LLD	<LLD	0
Milk (pCi/liter)	GSA (108): (e) (h) Cs-134	15	<LLD	<LLD	<LLD	0
	Cs-137	18	<LLD	<LLD	<LLD	0
	Ba/La-140	15	<LLD	<LLD	<LLD	0
	I-131 (108): I-131	1	<LLD	<LLD	<LLD	0

TABLE 4.0-1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220
NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410
OSWEGO COUNTY, STATE OF NEW YORK, JANUARY – DECEMBER 2002*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD(a)	INDICATOR LOCATIONS: MEAN (f) / RANGE	LOCATION (b) OF HIIGHEST ANNUAL MEAN LOCATION & MEAN (f) / RANGE	CONTROL LOCATION: MEAN (f) / RANGE	NUMBER OF NONROUTINE REPORTS
Food Products (pCi/kg-wet)	GSA (16): (h) I-131	60	<LLD	<LLD	<LLD	0
	Cs-134	60	<LLD	<LLD	<LLD	0
	Cs-137	80	<LLD	<LLD	<LLD	0

TABLE NOTES:

* = Data for Table 4.0-1 is based on TS/ODCM required samples unless otherwise indicated.

(a) = LLD values as required by the TS/ODCM. LLD units are specified in the medium column.

(b) = Location is distance in miles and direction in compass degrees based on NMP-2 reactor center-line. Units in this column are specified in medium column.

(c) = The TS/ODCM specify an I-131 and tritium LLD value for surface water analysis (non-drinking water) of 15 pCi/liter and 3000 pCi/liter respectively.

(d) = The TS/ODCM do not specify a particular LLD value to environmental TLDs. The NMP-1 and NMP-2 Offsite Dose Calculation Manuals contain specifications for environmental TLD sensitivities.

(e) = The TS/ODCM criteria for indicator milk sample locations include locations within 5.0 miles of the site. There are no milk sample locations within 5.0 miles of the site. Therefore, the only sample location required by the TS/ODCM is the control location. There were five optional locations during 2002.

(f) = Fraction of number of detectable measurements to total number of measurements. Mean and range results are based on detectable measurements only.

(g) = This dose is not representative of doses to a member of the public since this area is located near the north shoreline which is in close proximity to the generating facility and is not accessible to members of the public (See Section 5.2.4, TLDs).

(h) = Data includes results from optional samples in addition to samples required by the TS/ODCM.

(i) = Indicator TLD locations are: #7, 15, 23, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 18, 56, and 58. Control TLDs are all TLDs located beyond the influence of the site (TLD #: 14, 49).

SECTION 5.0

DATA EVALUATION AND DISCUSSION

5.0 DATA EVALUATION AND DISCUSSION

A. Introduction

Each year the results of the Annual Radiological Environmental Monitoring Program are evaluated considering plant operations at the site, the natural processes in the environment and the archive of historical environmental radiological data. A number of factors are considered in the course of evaluating and interpreting the Annual Environmental Radiological Data. This interpretation can be made using several methods including trend analysis, population dose estimates, risk estimates to the general population based on significance of environmental concentrations, effectiveness of plant effluent controls and specific research areas. The report not only presents the data collected during the 2002 sample program but also assesses the significance of radionuclides detected in the environment. It is important to note that detection of a radionuclide is not, of itself, an indication of environmental significance. Evaluation of the impact of the radionuclide in terms of potential increased dose to man, in relation to natural background, is necessary to determine the true significance of any detection.

B. Units of Measure

Some of the units of measure used in this report are explained below.

Radioactivity is the number of atoms in a material that decay per unit of time. Each time an atom decays, radiation is emitted. The *curie* (Ci) is the unit used to describe the activity of a material and indicates the rate at which the atoms are decaying. One curie of activity indicates the decay of 37 billion atoms per second.

Smaller units of the curie are used in this report. Two common units are the *microcurie* (uCi), one millionth (0.000001) of a curie, and the *picocurie* (pCi), one trillionth (0.000000000001) of a curie. The picocurie is the unit of radiation that is routinely used in this report. The mass, or weight, of radioactive material that would result in one curie of activity depends on the disintegration rate or half life. For example, one gram of radium-226 contains one curie of activity, but it would require about 1.5 million grams of natural uranium to equal one curie. Radium-226 is more radioactive than natural uranium on a weight or mass basis.

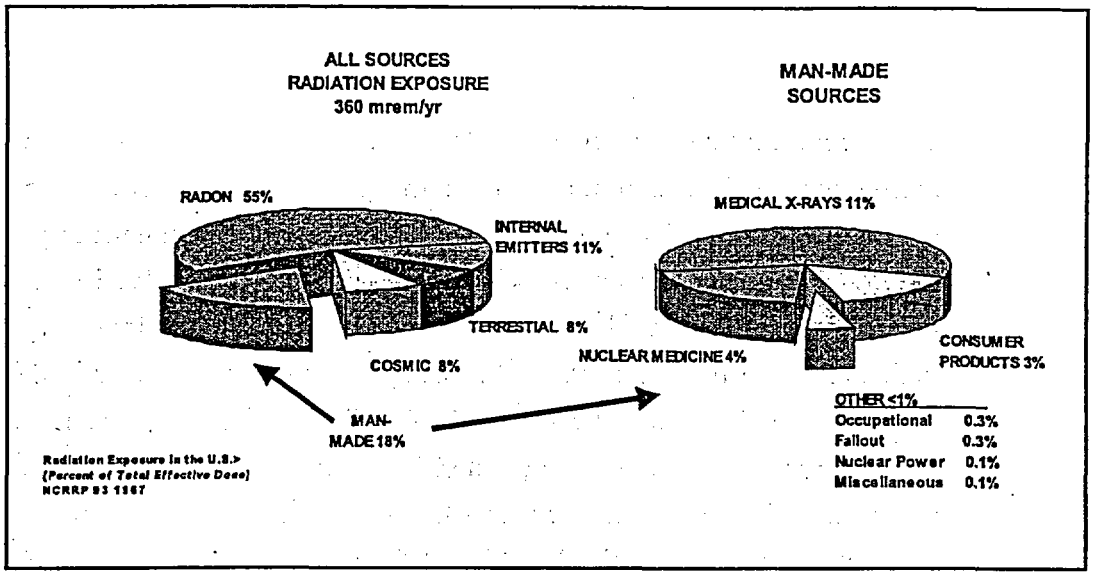
C. Dose/Dose to Man

The dose or dose equivalent, simply put, is the amount of ionizing energy deposited or absorbed in living tissue. The amount of energy deposited or ionization caused is dependent on the type of radiation. For example, alpha radiation can cause dense localized ionization that can be up to 20 times the amount of ionization for the same energy imparted as from gamma or x-rays. Therefore, a quality factor must be applied to account for the different ionizing capabilities of various types of radiation. When the quality factor is multiplied by the absorbed dose, the result is the dose equivalent, which is an estimate of the possible biological damage resulting from exposure to any type of ionizing radiation. The dose equivalent is measured in rem (roentgen equivalent man). In terms of environmental radiation, the rem is a large unit. Therefore, a smaller unit, the millirem (mrem) is often used. One millirem is equal to 0.001 of a rem.

The term "dose to man" refers to the dose or dose equivalent that is received by members of the general public at or beyond the site boundary. The dose is calculated based on concentrations of radioactive material measured in the environment. The primary pathways that contribute to the dose to man are the inhalation pathway, the ingestion pathway and direct radiation.

D. Discussion

There are three separate groups of radionuclides that were measured in the environment in the media analyzed for the 2002 sampling program. The first of these groups consists of those radionuclides that are naturally occurring. The environment contains a significant inventory of naturally occurring radioactive elements. The components of natural or background radiation include the decay of radioactive elements in the earth's crust, a steady stream of high-energy particles from space called cosmic radiation, naturally-occurring radioactive isotopes in the human body, like potassium-40, medical procedures, man-made phosphate fertilizers (phosphates and uranium are often found together in nature), and household items like televisions. In the United States, a person's average annual exposure from background radiation is 360 mrem, as illustrated on the following Background Radiation Chart (Ref. 14).



A number of radionuclides are present in the environment due to sources such as cosmic radiation and fallout from nuclear weapons testing. These radionuclides are expected to be present in many of the environmental samples collected in the vicinity of the Nine Mile Point Site. Some of the radionuclides normally present include:

- *Tritium*, present as a result of the interaction of cosmic radiation with the upper atmosphere,
- *Beryllium – 7*, present as a result of the interaction of cosmic radiation with the upper atmosphere,
- *Potassium –40 and radium-226*, naturally occurring radionuclides found in the human body and throughout the environment, and
- *Fallout radionuclides* from nuclear weapons testing, including cesium-137, strontium-89, and strontium-90.

Beryllium-7 and potassium-40 are especially common in REMP samples. Since they are naturally occurring and are abundant, positive results for these radionuclides are reported in some cases in Section 6.0 of this report. Comparisons of program samples to natural background radiation are made throughout this section to help put program results into perspective and to aid the reader in determining what, if any, significant

impact is demonstrated by the Radiological Environmental Monitoring Program (REMP) results.

The second group of radionuclides that were detected are a result of the detonation of thermonuclear devices in the earth's atmosphere. Atmospheric nuclear testing during the early 1950s produced a measurable inventory of radionuclides presently found in the lower atmosphere as well as in ecological systems. In 1963 an Atmospheric Test Ban Treaty was signed. Since the treaty, the global inventory of man made radioactivity in the environment has been greatly reduced through the decay of short lived radionuclides and the removal of radionuclides from the food chain by such natural processes as weathering and sedimentation. This process is referred to in this report as ecological cycling. Since 1963, several atmospheric weapons tests have been conducted by the People's Republic of China. In each case, the usual radionuclides associated with nuclear detonations were detected for several months following the test and then after a peak detection period diminished to a point where most could not be detected. Although reduced in frequency, atmospheric testing continued into the 1980's. The resulting fallout or deposition from these most recent tests has influenced the background radiation in the vicinity of the site and was evident in many of the sample media analyzed over the years. The highest weapons testing concentrations were noted in samples collected for the 1981 Environmental Surveillance Program. Cs-137 was the major byproduct of this testing and is still detected in a number of environmental media.

The third group of radionuclides that may be detected in the environment are those that are related to nuclear power technology. These radionuclides are the byproduct of the operation of light water reactors. These byproduct radionuclides are the same as those produced in atmospheric weapons testing and found in the Chernobyl fallout. This commonality makes a determination of the source of these radionuclides that may be detected in environmental samples difficult. During 2002, H-3 and Cs-137 were potentially plant-related radionuclides detected in the REMP samples.

A number of factors must be considered in performing radiological sample data evaluation and interpretation. The evaluation is made using several approaches including trend analysis and dose to man. An attempt has been made not only to report the data collected during 2002, but also to assess the significance of the radionuclides detected in the environment as compared to natural and other manmade radiation sources. It is important to note that detected concentrations of radionuclides

in the local environment as a result of human technology are very small and are of no or little significance from an environmental or dose to man perspective.

The 1987 per capita average dose was determined to be 360 mrem per year from all sources, as noted in NCRP Report No. 93 (Reference 14). This average dose includes such exposure sources as natural radiation, occupational exposure, weapons testing, consumer products and nuclear medicine. The 1987 per capita dose rate due to natural sources was 295 mrem per year. The per capita radiation dose from nuclear power production nationwide is less than one mrem per year.

The natural background gamma radiation in the environs of the Nine Mile Point Site, resulting from radionuclides in the atmosphere and in the ground, accounts for approximately 60-65 mrem per year. This dose is a result of radionuclides of cosmic origin (for example, Be-7) and of primordial origin (Ra-226, K-40, and Th-232). A dose of 60 mrem per year, as a background dose, is significantly greater than any possible doses as a result of routine operations at the site during 2002.

The results of each sample medium are discussed in detail in Sections 5.1 and 5.2. This includes a summary of the results, the estimated environmental impact, a detailed review of any relevant detections with a dose to man estimate where appropriate, and an analysis of possible long term and short term trends.

During routine implementation of the Radiological Environmental Monitoring Program, additional or optional environmental pathway media are sampled and analyzed. These samples are obtained to:

- Expand the area covered by the program beyond that required by the operating license,
- Provide more comprehensive monitoring than is currently required,
- Monitor the secondary dose to main pathways, and
- Maintain the analytical data base established when the plants began commercial operation.

These additional samples may include: aquatic vegetation (cladophora), bottom sediment, mollusk, milk (Sr-90), meat, poultry and soil samples. The optional samples that are collected will vary from year to year. In addition to the optional sample media, additional locations are sampled and analyzed for those pathways required by TS/ODCM. These additional sample locations are obtained to ensure that a variety of environmental pathways are monitored in a comprehensive manner. Data from additional sample locations that are associated with the required TS/ODCM sample media are included in the data presentation and evaluation. When additional locations are included, the use of this data is specifically noted in Section 5.1 and 5.2.

Section 6.0 contains the analytical results for the sample media addressed in the report. Tables are provided for each required sample medium analyzed during the 2002 program.

The tables comprising Section 7.0, Historical Data Tables, contain statistics from previous years environmental sampling. The process of determining the impact of plant operation on the environment includes the evaluation of past analytical data to determine if trends are changing or developing. As state-of-the-art detection capabilities improve, data comparison is difficult in some cases. For example, Lower Limits of Detections (LLDs) have improved significantly since 1969 due to technological advances in laboratory procedures and analytical equipment.

5.1 AQUATIC PROGRAM

The aquatic program consists of samples collected from three environmental pathways. These pathways are:

- Shoreline Sediment
- Fish
- Surface Waters

Section 6.0, Tables 6-1 through 6-4 present the analytical results for the aquatic samples collected for the 2002 sampling period.

5.1.1 SHORELINE SEDIMENT RESULTS

A. Results Summary

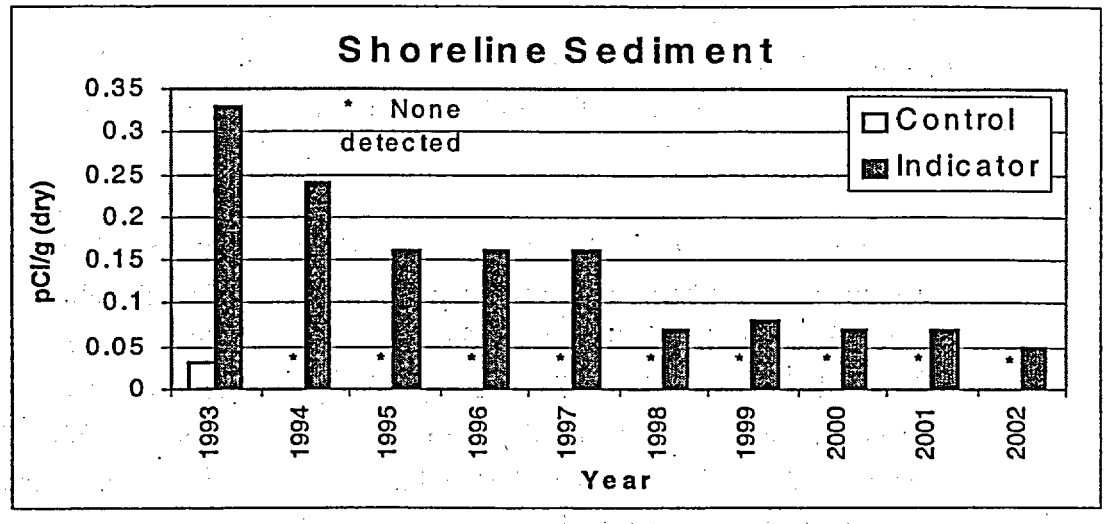
Shoreline sediment samples were obtained in April and October of 2002 at one off-site control location (near Oswego Harbor) and at one indicator location which is an area east of the site considered to have recreational value.

A total of four sediment samples were collected for the 2002 sample program, two indicator and two control. Cs-137 was detected in both samples collected from the Sunset Bay indicator location in 2002 and ranged from a minimum of 0.045 pCi/g (dry) to a maximum of 0.053 pCi/g (dry). Cs-137 was not detected in samples collected from the control location during 2002; however, Cs-137 has been detected in past control samples. Cs-137 was detected in control samples collected in 1993 at an average concentration of 0.027 pCi/g.

The general lack of Cs-137 at the control location is attributed to the differences in the sediment types between the two sample locations (See Data Evaluation and Discussion). The source of the Cs-137 detected in the indicator shoreline sediment is considered to be the result of fallout from atmospheric nuclear weapons testing and not from operations at the site. The mean concentration of Cs-137 measured in the 2002 indicator samples, is the lowest measured concentration since sampling began in 1985. Historical mean concentrations measured at the indicator location ranged from a maximum mean of 0.33 pCi/g in 1993 to a minimum mean value of 0.05 pCi/g (dry) in 2002. The results for the 2002 control location were less than the detection limit. No other plant related radionuclides were detected in the 2002 shoreline sediment samples.

The calculated potential whole body and skin doses which may result from the measured Cs-137 concentrations are extremely small and are insignificant when compared to natural background doses.

The following is a graph of the average Cs-137 concentration in shoreline sediment samples over the previous nine years. This graph illustrates a general downward trend in the Cs-137 concentrations since 1993.



B. Data Evaluation and Discussion

Shoreline sediment samples are routinely collected twice per year from the shoreline of Lake Ontario. Samples are collected from one indicator location (Sunset Bay), and one control location (Lang's Beach). Samples were collected from both the indicator and control locations in April and October 2002. The results of these sample collections are presented in Section 6.0, Table 6-1, "Concentrations of Gamma Emitters in Shoreline Sediment Samples – 2002". Cesium–137 (Cs-137) and potassium–40 (K-40) were the significant radionuclides detected in the sediment samples.

Cs-137 was detected in both April and October indicator samples collected for the 2002 program. The measured concentrations for these samples were 0.053 pCi/g (dry) and 0.045 pCi/g (dry). The presence of Cs-137 in certain environmental sample media such as soil, shoreline sediment and fish is common. Cs-137 is a fission product that is produced in power reactors and during atmospheric weapons testing. In addition to the Cs-137 found in the environment as a result of past weapons testing, a significant inventory of Cs-137 was also introduced globally as a result of the Chernobyl accident in 1986. Because Cs-137 is found in environmental samples as a result of weapons testing and Chernobyl, it is difficult to accurately determine the source of Cs-137 measured in the sediment sample. It is highly probable that the source of the cesium is from sources other than the operation of plants at the Nine Mile Point Site. It is likely that any sediment sample containing Cs-137 concentration which were the result of plant operation would also contain other plant related isotopes such as Co-60 and Cs-134. The absence of corroborating isotopes would indicate that the source of Cs-137

in sediment samples is from the existing background Cs-137 which is attributed to weapons testing and the Chernobyl accident. This assessment is further substantiated by the fact that Cs-137 was detected in the 1993 sediment control sample. Cs-137 has been routinely measured in the control samples of other environmental media such as fish and soil.

The general absence of Cs-137 in the control samples is attributed to the differences in the sediment types between the two sample locations. Few shoreline regions west of the site contain fine sediment and/or sand which would be representative of the indicator location. It is difficult to obtain control samples that are comparable in physical and chemical characteristics to the indicator samples. Other factors, which include changing lake level and shoreline erosion, further complicate attempts at consistency in shoreline sediment sampling. Recent soil samples from locations beyond any expected influence from the site have contained levels of Cs-137 equal to or greater than the concentrations found in 2002 shoreline sediment. The Cs-137 is commonly found in soil samples and is attributed to weapons testing fallout. Shoreline samples containing soil or sediment are likely to contain Cs-137.

C. Dose Evaluation

The radiological impact of Cs-137 measured in the shoreline sediment can be evaluated on the basis of dose to man. In the case of shoreline sediments, the critical pathway is direct radiation to the whole body and skin. Using the parameters provided in NRC Regulatory Guide 1.109, the potential dose to man in mrem per year can be calculated. The following regulatory guide values were used in calculating the dose to man:

- A teenager spends 67 hours per year at the beach area or on the shoreline,
- The sediment has a mass of 40 kg/m^2 (dry) to a depth of 2.5 cm,
- The shoreline width factor is 0.3, and
- The maximum measured Cs-137 concentration of 0.053 pCi/g (dry)

Using these conservative parameters, the potential dose to the maximum exposed individual (teenager) would be 0.00018 mrem/year to the whole body and 0.00021 mrem/year to the skin. This calculated dose is very small and is insignificant when compared to the natural background annual exposure of approximately 60 mrem.

D. Data Trends

The mean Cs-137 concentration for the shoreline sediment indicator samples for 2002 was 0.05 pCi/g (dry), which is the lowest mean concentration measured since sampling was initiated in 1985. Indicator samples collected in 1985 through 1988 contained no measurable concentrations of Cs-137. The mean values for previous ten years (1992 – 2001) ranged from a maximum mean value of 0.33 pCi/g (dry) in 1993 to a minimum mean of 0.07 pCi/g (dry) in 1998, 2000 and 2001. The mean indicator results for the previous five year period ranged from a maximum mean of 0.16 pCi/g (dry) in 1997 to a minimum mean of 0.07 pCi/g (dry) in 1998, 2000 and 2001.

Cs-137 was not detected in samples collected from the control location during 2002.

A review of indicator and control sample results for 1985 – 1988 indicate only naturally occurring radionuclides present in shoreline sediment. The period from 1989 to 2002 shows the presence of Cs-137 in the indicator samples. The historical data shows an emergence of Cs-137 concentrations in 1989 which continues through 2002. The trend since 1989 shows a reduction of Cs-137 concentrations over the four year period to the concentration of 0.13 pCi/g (dry) measured in 1992. The 1993 sample showed an increase in Cs-137 concentration to 0.33 pCi/g (dry) followed by a reduction in concentration to 0.24 pCi/g (dry) in 1994 and continued general reductions through 2002 to 0.05 pCi/g (dry). The overall five year trend for Cs-137 concentrations in shoreline sediment is a steady reduction in concentrations from year to year to a low mean concentration of 0.05 pCi/g (dry) in 2002.

Shoreline sediment sampling at the indicator location commenced in 1985. Prior to 1985, no data were available for long term trend analysis.

Tables 7-1 and 7-2 in Section 7.0 illustrate historical environmental data for shoreline sediment samples.

5.1.2 FISH SAMPLE RESULTS

A. Results Summary

A total of 21 fish samples were collected for the 2002 sample program. Fish species collected included Smallmouth Bass, Brown Trout, Lake Trout, Walleye and Salmon. Analytical results showed one sample having a detectable concentration of Cs-137. Cs-137 is a radionuclide related to past weapons testing. No other plant related radionuclides were detected in any of the other fish samples collected in 2002.

Cs-137 was detected in the Walleye indicator sample with a concentration of 0.016 pCi/g (wet). This concentration is consistent with Cs-137 mean concentrations found in Walleye samples collected over the past 4 years. This concentration of Cs-137 is very low and is below the required Lower Limit of Detection (LLD) of 0.15 pCi/g (wet) for Cs-137 in fish.

The small concentration of Cs-137 detected in the one Walleye indicator sample represents approximately 5% of the total fish samples collected from both the on-site and off-site locations. This percentage is consistent with fish samples collected in 2000 and is lower than the 9% and 11% for fish samples collected and analyzed in 1999 and 1998 respectively. In 1990, 43% of all samples collected contained Cs-137 with a mean concentration of 0.044 pCi/g (wet). This represents an overall downward trend in fish Cs-137 concentrations over the last thirteen years. Intermittent detection of Cs-137 in control and indicator samples began in 1996 and was not detected in any fish samples collected for the first time in 2001.

Comparable concentrations of Cs-137 are routinely found in samples of other aquatic media such as shoreline sediment, bottom sediment and aquatic vegetation. The potential whole body and critical organ doses calculated as a result of fish consumption by humans are very small. The dose that could result from the Cs-137 in fish can be considered background exposure because of the sources of the Cs-137.

The fish sample results demonstrate that plant operations at the Nine Mile Point Site have no measurable radiological environmental impact on the upper levels of the Lake Ontario food chain.

B. Data Evaluation and Discussion

Gill nets were used to collect fish from designated indicator and control sample locations. One control location was established in the Oswego Harbor area located greater than five miles from the site, and two indicator locations were established in the vicinity of the Nine Mile Point Nuclear Station (NMPNS) and James A. Fitzpatrick Nuclear Power Plant (JAFNPP) discharges. All samples were analyzed for gamma emitters. Table 6-2 shows individual results for all the samples collected in 2002 in units of pCi/g (wet).

The spring fish collection was made up of 12 individual samples representing 4 separate species. Smallmouth Bass, Brown Trout, Lake Trout and Walleye were collected from all sample locations.

The total fall fish collection was comprised of 9 individual samples representing 3 individual species. Smallmouth Bass, Brown Trout, and Salmon were also collected from all sample locations.

Cs-137 was detected in one of the 8 indicator samples collected in the spring from the NMPNS indicator sample at a concentration of 0.016 pCi/g (wet). Cs-137 was not detected in fish species collected from the JAFNPP indicator or control locations for the same sample period or in any of the fish samples collected during the fall sample period.

The Cs-137 indicator concentration was consistent with Cs-137 concentrations detected in 2000 control and 1999 indicator samples. The source of the Cs-137 in fish samples is considered to be the existing Cs-137 background concentration in the environment from weapons testing and Chernobyl.

C. Dose Evaluation

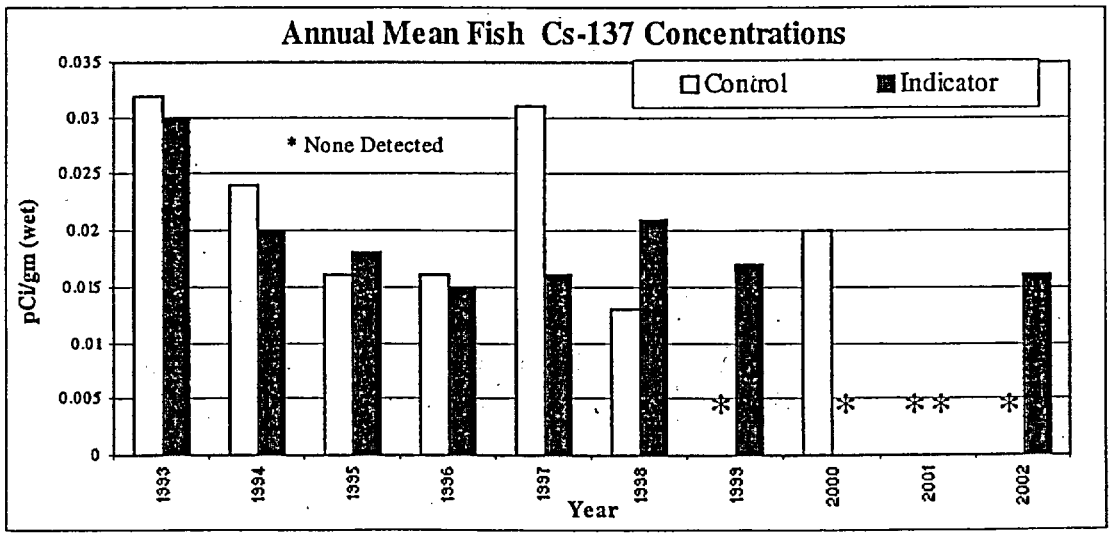
Some Lake Ontario fish species may be considered an important food source due to the local sport fishing industry. Therefore, these fish are an integral part of the human food chain. Based on the use of fish in the local diet, a conservative estimate of potential dose to man can be made. Assuming that an adult consumes 21 kg and a teen consumes 16.0 kg of fish per year, (Regulatory Guide 1.109 maximum exposed age group) and the fish consumed contains a Cs-137 concentration of 0.016 pCi/g

(wet), the adult whole body dose received would be 0.024 mrem per year. The organ of interest for Cs-137 is the teen liver; which would receive a calculated dose of 0.038 mrem per year. The Cs-137 whole body and organ doses are conservatively estimated doses based on the consumption of fish species from the Nine Mile Point area. Due to the long half-life of Cs-137, no radiological decay is assumed for the calculation of doses.

In summary, the potential whole body and organ doses received as a result of fish consumption are very small. The dose to man that could be received from the indicator sample group is considered to be background exposures. The dose to man from operation of the plants at Nine Mile Point via the fish pathway is of no significance.

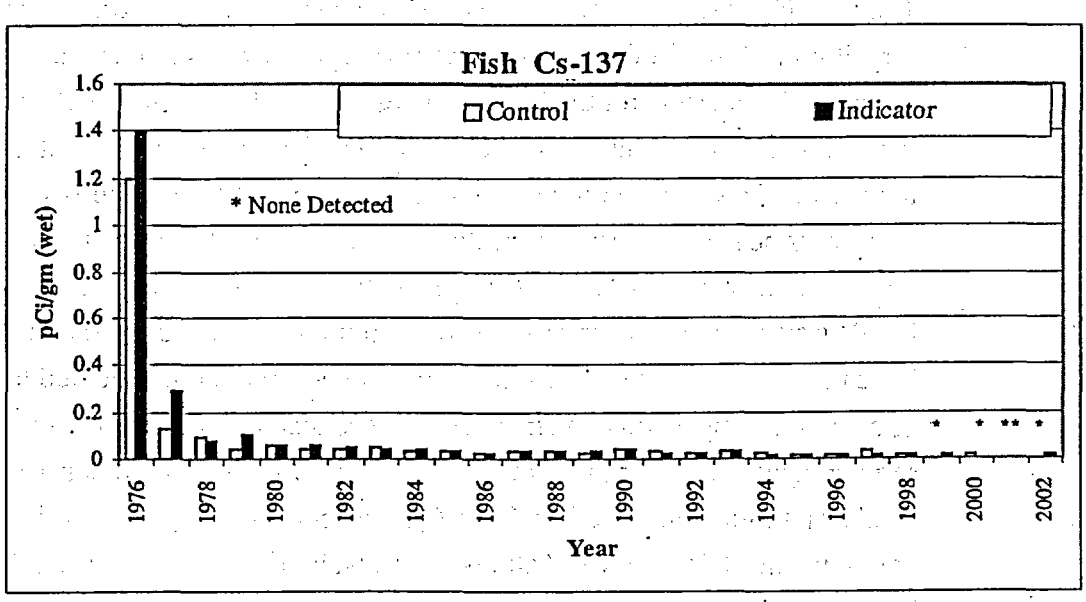
D. Data Trends

Results for the previous five years (1997 through 2001) have shown a steady downward trend of Cs-137 levels in both the control and indicator samples. During the period of 1990 through 1994, control and indicator mean results were on a small downward trend with a small rise in 1993. The 1994 through 2002 results as a group are the lowest Cs-137 concentrations measured since sampling began in 1974. Intermittent detection of Cs-137 in control and indicator samples began in 1999 and was not detected in any fish samples collected for the first time in 2001. The graph below illustrates the mean Cs-137 concentration for indicator and control samples collected over the past 10 years.



The long term trend shows that mean concentrations of Cs-137 for indicator samples have decreased from a maximum mean concentration of 1.4 pCi/g (wet) in 1976 to a minimum mean concentration of 0.018 pCi/g (wet) in 1997. The decreasing trend continued throughout 2002 with intermittent detections beginning in 2000. Control sample Cs-137 results have also decreased from a maximum mean concentration of 1.2 pCi/g (wet) in 1976 to intermittent detections beginning in 1999. Fish results for the 2002 indicator sample shows a decrease in concentration by a factor of approximately 87 compared to 1976. Control results have shown a similar reduction.

The general long term decreasing trend for Cs-137 concentrations found in fish, illustrated in the graph below, is most probably a result of the cesium becoming unavailable to the ecosystem due to ion exchange with soils and sediments and radiological decay. The concentrations of Cs-137 detected in fish since 1976 are a result of weapons testing fallout. The general downward trend in concentrations will continue as a function of additional ecological cycling and nuclear decay.



Tables 7-3 and 7-4 in Section 7.0 show historical environmental sample data for fish.

5.1.3 SURFACE WATER (LAKE)

A. Results Summary

The TS/ODCM require that monthly surface water samples be taken from the respective inlet water supply of the James A. FitzPatrick N.P.P. and NRG Energy's Oswego Steam Station. In conjunction with the required samples, three additional Lake Ontario surface water locations are sampled and analyzed. These additional locations are the Oswego City Water Intake, the NMP Unit #1 Intake and the NMP Unit #2, Intake. Gamma spectral analysis was performed on 24 monthly composite samples from the TS/ODCM locations and on 36 monthly composite samples from the additional sample locations. The results of the gamma spectral analysis show that only naturally occurring radionuclides were detected in the 60 samples from the five locations collected for the 2002 Sampling Program. The two naturally occurring radionuclides detected were K-40 and Ra-226 and are not related to operations of the plant. Monthly composite samples show no presence of plant related gamma emitting isotopes in the waters of Lake Ontario as a result of the operation of the plant.

The monthly surface water samples are composited on a quarterly basis and are analyzed for tritium. A total of 20 samples were analyzed for tritium as part of the 2002 REMP program. The results for the 2002 samples showed two positive detections of tritium and the remaining 18 results were below the established measurement sensitivity and are reported as less than the lower limit of detection (<LLD). The two positive detections were very near the measurement threshold and were detected in the FitzPatrick second quarter inlet sample and the Oswego City Water second quarter inlet sample. The FitzPatrick sample had a measured concentration of 297±85 pCi/l and is designated as an indicator sample. The Oswego City Water inlet sample is considered to be representative of a control sample and contained a similar concentration of 268±83 pCi/l. Both of these sample results are near the established detection limit and are consistent with historical levels of tritium measured in Lake Ontario control samples. Tritium is found in the environment at low concentrations as a result of natural production from cosmic ray interaction in the upper atmosphere and from past weapons testing. The measured concentrations of these samples are within the normal historical variation for naturally occurring tritium levels in surface water. There is no indication of a long-term buildup of tritium concentrations in the surface water adjacent to the site.

B. Data Evaluation and Discussion

Gamma spectral analysis was performed on monthly composite samples from five Lake Ontario sampling locations. No plant related radionuclides were detected in 2002 samples. This is consistent with historical data, which has not shown the presence of plant related radionuclides in surface water samples.

Tritium samples are quarterly samples that are a composite of the appropriate monthly samples. Tritium results for the James A. FitzPatrick inlet canal samples had one positive detection of 297±85, and the remaining results had a LLD that ranged from <270 pCi/l to <290 pCi/l. The TS/ODCM control location (Oswego Steam Station inlet canal) results showed no positive detection and the sample results had an LLD range of <260 pCi/l to <280 pCi/l.

Tritium was also detected in one of the twelve optional Lake Ontario samples collected in the 2002 program. The second quarter Oswego City Water inlet sample showed a measured concentration of 268±83 pCi/l. The Oswego City Water inlet is sampled to monitor drinking water quality and is representative of a control location due to its distance from the site. The city water inlet is located 7.8 miles west of the site in an "up-stream" direction based on the current patterns in the lake. The two measured concentrations of tritium in the 2002 sample program are well within the bounds for control location concentrations measured over the past fifteen years. The remaining three sample locations showed no measurable concentrations of tritium in the samples collected for the 2002 sample program.

A summary of tritium results for the 2002 sample program is listed below:

Sample Location	Tritium Concentration pCi/liter		
	Minimum	Maximum	Mean (Annual)
JAF Inlet (Indicator)*	<270	297±85	297±85
Oswego Steam Inlet Control)*	<260	<280	<270
NMP #1 Inlet	<270	<290	<275
NMP #2 Inlet	<270	<290	<275
Oswego City Water Supply	<260	268±83	268±83

* Sample location required by TS/ODCM

C. Dose Evaluation

The measured concentration of tritium in the FitzPatrick inlet sample is consistent with off-site control concentrations based on historical control location results. The radiological impact to members of the public from low levels of tritium in water is insignificant. This can be illustrated by calculating a dose to the whole body and maximum organ using Regulatory Guide 1.109 methodology. Based on a water ingestion rate of 510 liters/year and the maximum measured concentration of 297 pCi/l. The calculated dose would be 0.031 mrem to the child whole body and 0.031 mrem to the child liver (critical age group/organ).

The drinking water sample is from the Oswego City water intake, which is drawn from Lake Ontario at a location more distant from the site than the control location. The maximum potential dose from the use of Oswego City water can be calculated using the LLD concentration calculated for the city water supply. The calculated dose from tritium at this location, using the LLD concentration of <290 pCi/l, would be 0.03 mrem to the child whole body and 0.03 mrem to the child liver. Doses, calculated from the 2002 sample results, are considered background doses and are negligible compared to the 300 mrem annual dose considered to be the overall background annual dose from all sources.

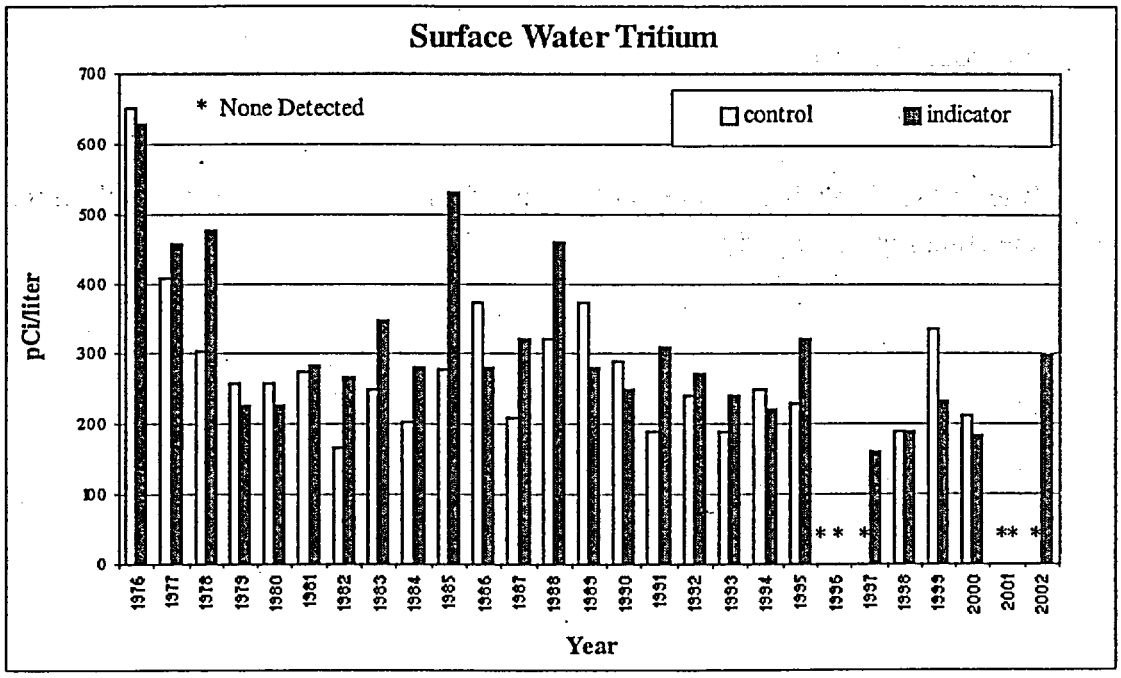
D. Data Trends

There are no data trends for gamma emitters such as Cs-137 and Co-60 as historically these radionuclides have not been detected in lake water samples.

Tritium results for the 2002 lake water samples were consistent with results from the previous five years for both the indicator and control locations. During the previous five year period the maximum mean indicator and control concentrations were measured in 1999. The mean measured tritium concentrations for the previous five year period of 1997 - 2001 ranged from 190 pCi/l to 365 pCi/l for the control and 160 pCi/l to 233 pCi/l for the indicator locations. By comparison, the mean 2002 tritium concentrations were <270 pCi/l for the control and 297 pCi/l for the indicator location. The previous five year data indicates no significant trends in either the indicator or the control mean concentrations. This previous five year data set is consistent with long term tritium results measured at the site. The indicator data from the previous ten year period, 1992 through 2001, is representative of natural variations in environmental tritium concentrations with no significant levels of tritium measured. The 1999 mean control value of 365 pCi/l is the highest concentration measured since 1986 but is within the

variability of results measured over the life of the program. The ten year historical results are consistent between the control and indicator locations with no large variation in the measured results.

The following graph illustrates the concentrations of tritium measured in Lake Ontario over the past 28 years at both an indicator and control location. Prior to 1985, the Oswego, City Water Supply results are used as control location data as this location closely approximates the Oswego Steam Station, the current control location.



Historical data for Surface Water Tritium is presented in Section 7.0, Tables 7-7 and 7-8.

5.2 TERRESTRIAL PROGRAM

The terrestrial program consists of samples collected from four environmental pathways. These pathways are:

- Airborne particulate and radioiodine,
- Direct Radiation,
- Milk, and
- Food Products

Tables 6-5 through 6-12 present the analytical results for the terrestrial samples collected for the 2002 reporting period.

5.2.1 AIR PARTICULATE GROSS BETA

A. Results Summary

Weekly, air samples were collected and analyzed for particulate gross beta particulate activity. For the 2002 program, a total of 52 samples were collected from control location R-5 and 208 samples were collected from indicator locations R-1, R-2, R-3, and R-4. These five locations are required by the TS/ODCM. Additional air sampling locations are maintained and are discussed in Section 5.2.1.B below. The mean gross beta concentration for samples collected from the control location (R-5) in 2002 was 0.016 pCi/m^3. The mean gross beta concentration for the samples collected from the indicator locations (R-1, R-2, R-3, and R-4) in 2002 was 0.016 pCi/m^3. The mean gross beta results for the indicator and the control stations were equal in 2002. The consistency between the indicator and control means demonstrates that there are no increased airborne radioactivity levels in the general vicinity of the site. The indicator results are consistent with concentrations measured over the last fourteen years. This consistency demonstrates that the natural baseline gross beta activity has been reached. The manmade radionuclide contribution to the natural background from atmospheric weapons testing and Chernobyl can no longer be detected above the background concentrations of naturally occurring beta emitting radionuclides.

B. Data Evaluation and Discussion

The air monitoring system consists of fifteen sample locations, six on-site and nine off-site. Each location is sampled weekly for particulate gross beta activity. A total of 780 samples were collected and analyzed as part of the 2002 program. Five of the nine off-site locations are required by TS/ODCM. These locations are designated as R-1, R-2, R-3, R-4, and R-5. R-5 is a control location required by the TS/ODCM and is located beyond any local influence from the site. In addition, optional off-site and on-site air sample locations are maintained from which weekly samples are collected. The optional off-site locations are designated as D-2, E, F and G. The optional on-site locations are designated as D-1, G, H, I, J and K.

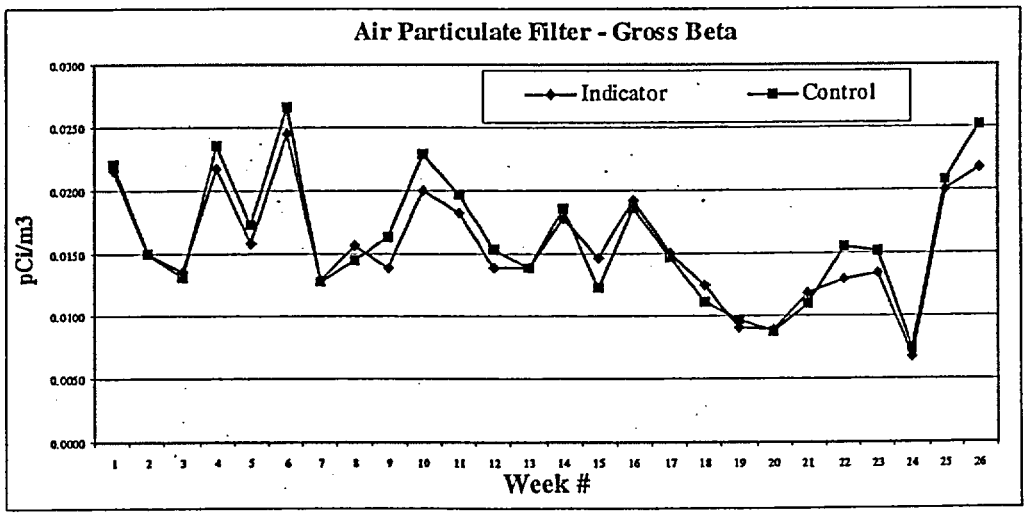
Gross beta analysis requires that the samples be counted no sooner than 24 hours after collection. This allows for the decay of short half-life naturally occurring radionuclides, thereby increasing the sensitivity of the analysis for plant related radionuclides.

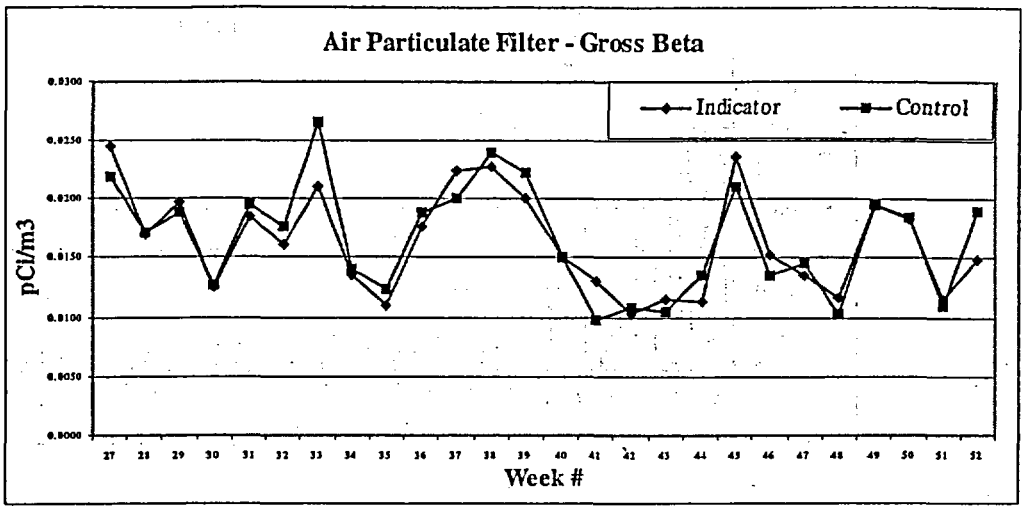
Tables 6-5 and 6-6 in Section 6.0 present the weekly gross beta activity results for samples collected from the off-site and on-site locations.

The average annual gross beta indicator concentrations for the TS/ODCM indicator stations (R-1, R-2, R-3 and R-4) was 0.016 pCi/m^3. The off-site TS/ODCM control station (R-5) annual mean gross beta concentration was 0.016 pCi/m^3. The minimum, maximum and average gross beta results for sample locations required by TS/ODCM were:

	Concentration pCi/m^3		
Location	Minimum	Maximum	Mean
R-1	0.007	0.026	0.016
R-2	0.006	0.025	0.016
R-3	0.007	0.025	0.016
R-4	0.007	0.025	0.016
R-5	0.008	0.027	0.016

The mean weekly gross beta concentrations measured in 2002 are illustrated in the graphs below.





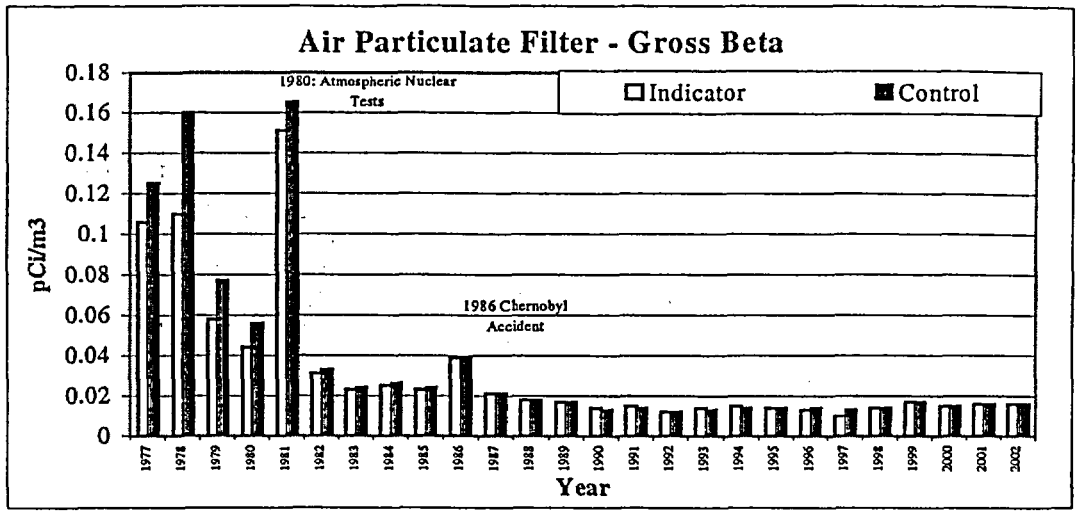
The fluctuations observed in the gross beta activity over the year can be attributed to changes in the environment, especially seasonal changes. The concentrations of naturally occurring radionuclides in the lower levels of the atmosphere directly above the land are affected by time related processes such as wind direction, precipitation, snow cover, soil temperature and soil moisture content.

C. Dose Evaluation

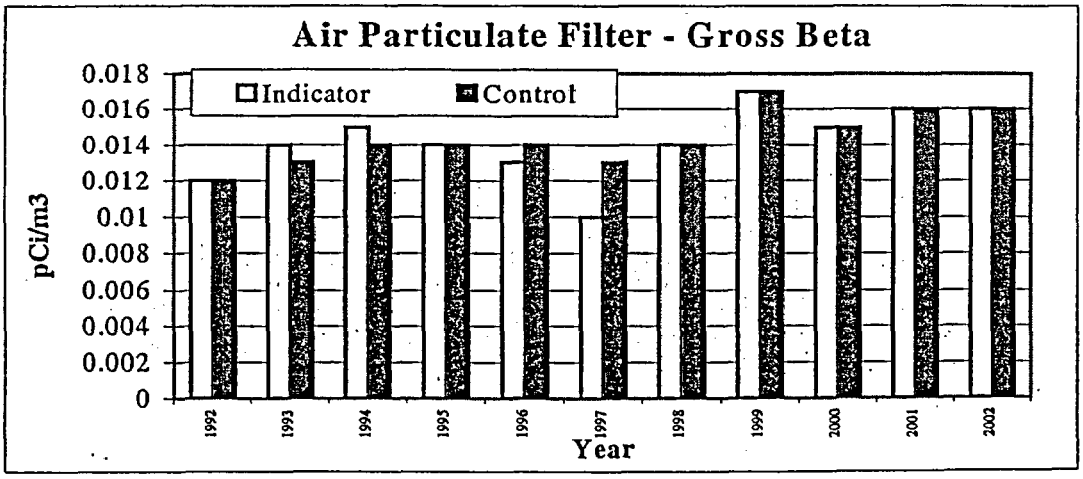
Dose calculations are not performed based on gross beta concentrations. Dose to man as a result of radioactivity in air is calculated using the specific radionuclide and the associated dose factor. See Section 5.2.2.C for dose calculations from air concentrations. The dose received by man from air gross beta concentration is a component of the natural background.

D. Data Trends

With the exception of the 1986 sample data, which was affected by the Chernobyl accident, the general trend in air particulate gross beta activity has been one of decreasing activity since 1981, when the mean control value was 0.165 pCi/m^3. The 1981 samples were affected by fallout from a Chinese atmospheric nuclear test which was carried out in 1980.



The trend for the previous five years represents a base line concentration or natural background level for gross beta concentrations. This trend is stable with minor fluctuations due to natural variations. The change in concentrations over the period of 1992 through 2002 is very small. This is illustrated by the following graph.



For the operational period of 1992 – 2002, the mean annual gross beta concentration at the control station (R-5) has remained steady with a narrow range of 0.012 pCi/m^3 to 0.016 pCi/m^3. The mean annual concentrations for the indicator stations for this same time period were similar to the control and ranged from a maximum mean of 0.017 pCi/m^3 in 1999 to a minimum mean of 0.010 pCi/m^3 in 1997. The 2002 gross beta results are consistent with previous results over this 10 year period.

Historical data of air particulate gross beta activity are presented in Section 7.0, Tables 7-9 and 7-10.

5.2.2 MONTHLY PARTICULATE COMPOSITES (GAMMA EMITTERS)

A. Results Summary

Fifteen air monitoring stations are maintained around the Nine Mile Point Site. Five of the 15 air monitoring stations are required by TS/ODCM and are located off-site near the Site Boundary and off-site as a control location. Ten additional air sampling stations are also maintained as part of the sampling program. Together, these fifteen continuous air sampling stations make up a comprehensive environmental monitoring network for measuring radioactive air particulate concentrations in the environs of the site. Annually, the air monitoring stations provide 780 individual air particulate samples which are assembled by location into 180 monthly composite samples. The monthly composites are analyzed using gamma spectroscopy.

No plant related gamma emitting radionuclides were detected in any of the air particulate filter samples collected during 2002.

The gamma analysis results for the monthly composite samples routinely showed positive detections of Be-7, K-40, and Ra-226. Each of these radionuclides is naturally occurring.

B. Data Evaluation Discussion

A total of fifteen air sampling stations are in continuous operation and located both on-site and in the off-site sectors surrounding the Nine Mile Point Site. Five of the fifteen monitoring stations are required by the TS/ODCM and the remaining ten are optional to provide an effective monitoring network. Composite air filter samples are assembled for each of the fifteen sampling locations. Each of the four weekly air particulate samples for the month is assembled by location to form monthly composite samples. The monthly composite samples required by TS/ODCM are composite samples assembled for R-1, R-2, R-3, R-4 and R-5. Other sample locations not required by the TS/ODCM for which analytical results have been provided include six on-site locations and four off-site locations. The analytical results for the 180 air particulate filter composites in 2002 showed no detectable activity of plant related radionuclides.

The results of the monthly composite samples are presented in Section 6.0, Table 6-9.

C. Dose Evaluation

The calculated dose as a result of plant effluents is not evaluated due to the fact that no plant related radionuclides were detected in 2002. The monthly air particulate sampling program demonstrated no off-site dose to man from this pathway as a result of operations of the plants located at the Nine Mile Point Site.

D. Data Trends

No plant related radionuclides were detected during 2002 at the off-site air monitoring locations.

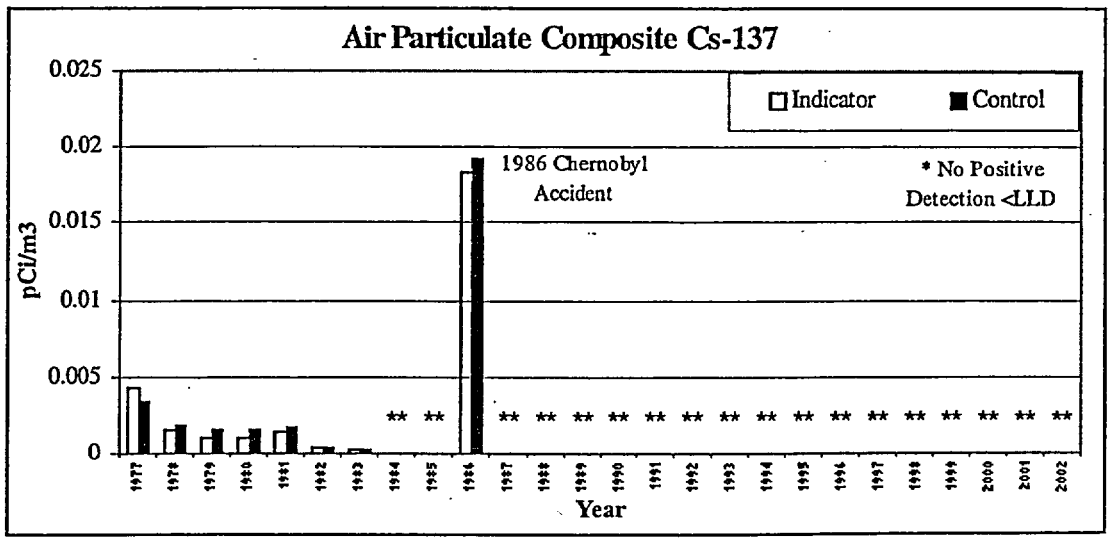
The five year database of air particulate composite analysis shows that there is no buildup or routine presence of plant related radionuclides in particulate form in the atmosphere around the site. Historically Co-60 was detected in each of the years from 1977 through 1984 at both the indicator and control locations with the exception of 1980 when Co-60 was not detected at the control location.

The presence of Co-60 in the air samples collected during these years was the result of atmospheric weapons testing. The maximum yearly mean concentration detected during this period was in 1977 when the mean for the indicator results was 0.0179 pCi/m^3. The mean Co-60 control value for this same year was 0.0172 pCi/m^3. During the period of 1977 through 1984, the Co-60 in the air particulate samples trended downward to a mean concentration of 0.0008 pCi/m^3 at the control location in 1984. Co-60 was detected in an off-site 2000 indicator sample and was the first positive detection of Co-60 since 1984. The detection of Co-60 in the one 2000 sample was an isolated event associated with effluents from the Nine Mile Point Unit 1 Facility. There have been no subsequent measurable concentrations of Co-60 in the environment surrounding the Nine Mile Point Site.

Historical data shows that Cs-137 is the fission product radionuclide most frequently detected in the air particulate filter composites. Cs-137 was detected in each of the years from 1977 through 1983 at both the control and indicator sampling locations. The maximum Cs-137 concentrations for this period were measured in 1977 with a mean indicator concentration of 0.0043 pCi/m^3 and the corresponding control concentration of 0.0034 pCi/m^3. After 1977, the Cs-137 concentration showed a reduction by a factor of approximately two and remained constant through 1981. In

1982, a second reduction in Cs-137 concentration was measured followed by a further reduction in concentration in 1983. Cs-137 was not detected in any of the indicator or control air particulate composite samples collected during 1984 and 1985.

For the period, 1986 to 1991, Cs-137 was detected only in 1986 due to the fallout from the Chernobyl accident. The 1986 mean concentration of Cs-137 for samples collected from the control location was 0.0193 pCi/m^3. The mean concentration of Cs-137 for the indicator location was 0.0183 pCi/m^3 for the same sample period. This overall reduction in Cs-137 concentration since 1977 is attributed to nuclear decay and ecological cycling of Cs-137 since it was initially produced as a result of weapons testing. The decrease in air particulate Cs-137 concentrations since 1977 is clearly illustrated in the following graph of historical data.



In addition to Cs-137, a number of other radionuclides were detected in samples collected during 1986. The isotopes Zr-95, Ce-141, Nb-95, I-131, Ce-144, Mn-54, Ru-103, Ru-106, and Ba-140 were all detected in air particulate composite samples as a result of the fallout from the Chernobyl accident. After 1986, no plant related or fallout radionuclides were detected in any of the off-site air particulate composite samples with the exception of the isolated detection of Co-60 in 2000 in a single sample. A review of the past five year's data for air particulate filter composites indicates no plant related radiological impact on the environment. All previous historical positive detections of fission product radionuclides were associated with

atmospheric weapons testing or the Chernobyl accident, with the exception of the 2000 detection noted above.

Historical data for air particulate results are presented in Section 7.0, Tables 7-13 and 7-14.

5.2.3 AIRBORNE RADIOIODINE (I-131)

A. Results Summary

Iodine-131 (I-131) was not detected in any of the 780 samples analyzed for the 2002 program. No radioiodine has been measured off-site at the constant air monitoring stations since 1987.

B. Data Evaluation and Discussion

Airborne radioiodine is monitored at the fifteen air sampling stations also used to collect air particulate samples. There are nine off-site locations, five of which are required by TS/ODCM. The off-site locations required by TS/ODCM are designated as R-1, R-2, R-3, R-4 and R-5. R-5 is a control station located beyond any local influence from the plant. Ten air sampling locations are also maintained in addition to those required by TS/ODCM. Six of these stations D-1, G, H, I, J and K are located on-site. D-2, E, F and G are the optional stations located off-site.

Samples are collected using activated charcoal cartridges. They are analyzed weekly for I-131. No I-131 was detected in any of the 2002 samples collected.

The analytical data for radioiodine are presented in Section 6.0, Tables 6-7 and 6-8.

C. Dose Evaluation

The calculated dose as a result of I-131 was not evaluated due to the fact no I-131 was detected during 2002. The I-131 sampling program demonstrated no off-site dose to man from this pathway as a result of operation of the plants located at Nine Mile Point.

D. Data Trends

No radioiodine has been detected in samples collected from the air sampling locations required by TS/ODCM since 1987.

There has been no positive detection of I-131 in air samples collected over the last ten years. This demonstrates that there is no measurable environmental impact or positive

trend for iodine buildup due to plant operations during the period from 1992 through 2002. I-131 has previously been detected in samples collected during the last fifteen year period in 1986 and 1987. The 1986 detection of I-131 was the result of the Chernobyl accident and the 1987 detection was the result of plant operations.

Iodine-131 has been detected in the past at control locations. Control samples collected during 1976 had a mean I-131 concentration of 0.60 pCi/m^3. During 1977 this mean decreased to 0.32 pCi/m3, and further decreased by a factor of ten to 0.032 pCi/m^3 in 1978. I-131 was not detected in samples collected from the control location during 1979 – 1981 and 1983 – 1985. I-131 was detected once at the control location during 1982 at a concentration of 0.039 pCi/m^3.

Iodine-131 has been detected in samples collected from the on-site indicator locations during 1980 – 1983 and 1986 – 1987. The mean concentrations ranged from 0.013 pCi/m^3 in 1980 to a maximum of 0.119 pCi/m^3 in 1986. The maximum mean indicator I-131 concentration of 0.119 pCi/m^3 was the result of the Chernobyl accident. I-131 was detected in a total of 75 weekly samples collected during the 1986 sample program. The 1986 measured concentrations ranged from a minimum of 0.023 pCi/m^3 to a maximum of 0.36 pCi/m^3. Each positive detection of I-131 in samples collected in 1986 was the direct result of the Chernobyl Nuclear accident.

Historical data for I-131 are presented in Section 7.0, Tables 7-11 and 7-12.

5.2.4 DIRECT RADIATION THERMOLUMINESCENT DOSIMETERS (TLD)

A. Results Summary

Thermoluminescent dosimeters (TLDs) are used to measure direct radiation (gamma dose) in the environment. As part of the 2002 environmental monitoring program, TLDs were placed at a total of 72 different environmental TLD locations (32 required by TS/ODCM and 40 optional locations). These TLDs were placed, collected and read each quarter of 2002. As a result of placing two TLDs at each location, the results presented in this report are the average of two TLD readings obtained for a given location.

The 72 TLDs were placed in the following five geographical locations around the site boundary:

- On-site (areas within the site boundary)
- Site Boundary (area of the site boundary in each of the 16 meteorological sectors)
- Off-site Sector (area four to five miles from the site in each of the eight land based meteorological sectors)
- Special Interest (areas of high population density and use), and
- Control (areas beyond significant influence of the site)

All geographical locations are required by the TS/ODCM with the exception of the On-site area which was optional. Description of the five geograpical categories and the designation of specific TLD locations that make up each category is presented in Section 3.1.5, TLD (Direct Radiation) of this report.

A summary of the 2002 dose rates for each of the five geographical locations is as follows:

	Dose in mrem per standard month		
Geographic Category	Min	Max	Mean
On-site (Optional)	3.5	13.6	5.3
Site Boundary (Inner Ring) * (1)	3.5	5.1	4.3
Off-site Sectors (Outer Ring) *	3.1	5.3	4.2
Special Interest * (2)	3.5	4.7	4.1
Control * (3)	3.4	5.2	4.1

* Geographical locations required by TS/ODCM

1 Only includes TLD results that are not affected by radwaste direct shine (TLD nos. 78, 79, 80, 81, 82, 83, 84, 7, 18)

2 Only includes TLD results required by TS/ODCM (TLD nos. 15, 56, 58, 96, 97, 98)

3 Only includes TLD results required by TS/ODCM (TLD nos. 14, 49)

Comparison of annual mean dose rates associated with each geographical location indicate that there is no statistical difference in annual dose as a function of distance from the site boundary. The measured annual dose rate at the nearest resident to the site was consistent with the dose rates measured at the site boundary and control locations. The results for the Site Boundary, Offsite Sectors and Special Interest (Off-site) were well within expected normal variation when compared to the Control TLD results.

The results for the 2002 environmental TLD monitoring program indicate that there is no significant increase in dose rates as a result of operations at the site. The Hydrogen Water Chemistry systems used at NMPNS did not measurably increase the ambient radiation exposure rate beyond the site boundary.

The results of the 2002 TLD monitoring program demonstrate compliance with the wholebody offsite dose limits for members of the public specified in 40CFR190.

B. Data Evaluation and Discussion

Direct Radiation (Gamma Dose) measurements were taken at 72 different environmental locations during 2002, 32 of which are required by the TS/ODCM. These locations are grouped into five geographical location categories for evaluation of results. The five categories include: On-site, Site Boundary, Off-site Sector, Special Interest and Control locations. All categories are required by the TS/ODCM with the exception of the On-site TLDs. On-site TLDs are placed at various locations within the site boundary to provide additional information on direct radiation levels at and around the Unit 1, Unit 2 and FitzPatrick facilities.

On-site TLDs are optional and are subdivided into three categories for which direct radiation results are evaluated. The 2002 direct radiation results for Onsite TLD locations were as follows:

1. Results for TLDs located near the Unit 1, Unit 2 and FitzPatrick generating facilities and at previous or existing on-site air monitoring stations ranged from 3.5 to 13.6 mrem per standard month.

2. Results for TLDs located near the north shoreline of Unit 1, Unit 2 and Fitzpatrick facilities in close proximity to the Radwaste and Unit 1 Reactor Building ranged from 5.2 to 24.8 mrem per standard month.

3. Results for TLDs located onsite near the Energy Information Center and its associated shoreline ranged from 3.7 to 5.5 mrem per standard month.

Site Boundary TLD results ranged from 3.5 to 9.4 mrem per standard month in 2002. This range included all TLDs placed in each of the 16 meteorological sectors in the general area of the site boundary. The highest dose rate measured at a location required by the TS/ODCM was 9.4 mrem per standard month. This TLD, (TLD 85) represents the site boundary maximum dose and is located in the WNW sector along the lake shore in close proximity to the NMP Unit 1 plant. The TLD locations along the lakeshore close to the plants (TLD #'s 75, 76, 77, 85, 86 and 87) are influenced by radwaste buildings and radwaste shipping activities. These locations and are not accessible to members of the public and the TLD results for these areas are not representative of dose rates measured at the remaining site boundary locations. The remaining Site Boundary TLD locations, which are located away from the plant ranged from 3.5 to 5.1 mrem per standard month resulting in an average dose rate of 4.3 mrem per standard month.

Off-site Sector TLDs, required by TS/ODCM, located 4 to 5 miles from the site in each of the 8 land based meteorological sectors ranged from 3.1 to 5.3 mrem per standard month with an average dose rate of 4.2 mrem per standard month.

Special Interest TLDs from all locations ranged from 3.2 to 5.1 mrem per standard month with a 2002 annual dose rate of 4.2 mrem per standard month.

The Control TLD group required by TS/ODCM utilizes locations positioned well beyond the site. 2002 Control TLD results ranged from 3.5 to 5.5 mrem per standard month with an annual average dose rate of 4.3 mrem per standard month. These results include both the TS/ODCM required control TLDs and the three additional control TLDs.

C. Dose evaluation

2002 annual mean dose rates for each geographic location required by TS/ODCM are as follows:

Site Boundary:	4.3 mrem per standard month	(TLD Nos.: 78, 79, 80, 81, 82, 83, 84, 7, 18)
Off-site Sectors:	4.2 mrem per standard month	(TLD Nos.: 88, 89, 90, 91, 92, 93, 94, 95)
Special Interest:	4.1 mrem per standard month	(TLD #s: 15, 56, 58, 96, 97, 98)
Control:	4.1 mrem per standard month	(TLD #s 14, 49)

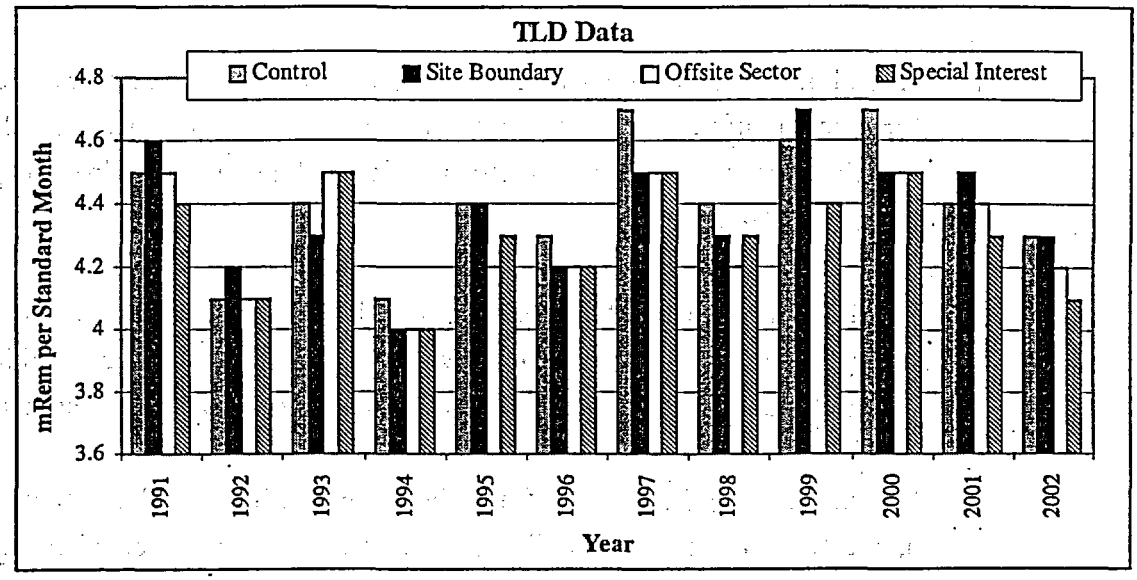
The measured mean dose rate in the proximity of the closest resident was 4.2 mrem per standard month (TLD Nos.: 108, 109) which is consistent with the control measurements of 4.1 mrem per standard month.

The mean annual dose for each of the geographic location categories demonstrates that there is no statistical difference in the annual dose as a function of distance from the site. The TLD program verifies that operations at the site do not measurably contribute to the levels of direct radiation present in the off-site environment.

D. Data Trends

A comparison of historical TLD results can be made using the different geographical categories of measurement locations. These include Site Boundary TLDs located in each of the 16 meteorological sectors, TLDs located off-site in each land based sector at a distance of 4 to 5 miles from the site, TLDs located at special interest areas and TLDs located at control locations. Site Boundary, Off-site Sector and Special Interest TLD locations became effective in 1985; therefore trends for these results can only be evaluated for 1985 to the present.

The following graph illustrates TLD results for the Control, Site Boundary, Off-site Sectors and Special Interest groups from 1991 through 2002:



TLDs located at the site boundary averaged 4.3 mrem per standard month during 2002 (Site Boundary average results do not include TLDs influenced by radwaste buildings and radwaste shipping activities). This result is consistent with the previous five year average of 4.4 mrem per standard month.

Off-site Sector TLDs averaged 4.2 mrem per standard month during 2002. This result is also consistent with the previous five year average of 4.4 mrem per standard month for off-site sectors.

Special Interest TLD locations averaged 4.1 mrem per standard month during 2002 which is consistent with the previous five year average of 4.4 mrem per standard month.

The last group of TLD locations required by TS/ODCM is the Control Group. This group utilized TLD locations positioned well beyond the site. 2002 control results from all Control TLDs averaged 4.1 mrem per standard month, consistent with the previous five year average of 4.4 mrem per standard month. The 2002 TLD program results, when compared to the previous seventeen years, show no significant trends relative to increased dose rates in the environment.

Tables 7-15 through 7-20 show the historical environmental sample data for environmental TLDs.

5.2.5 MILK

A. Results Summary

A total of 108 milk samples were collected during the 2002 program and analyzed for gamma emitting radionuclides using gamma spectroscopy. In addition, each sample undergoes an iodine extraction procedure to determine the presence of Iodine-131 (I-131).

I–131, a possible plant related radionuclide, is measured to evaluate the land deposition, grass, cow, dose pathway to man. I-131 was not detected in any of the 108 milk samples collected in 2002 from the six milk sample locations.

Gamma spectral analyses of the bimonthly milk samples showed that only naturally occurring radionuclides, such as K-40, were detected in milk samples collected during 2002. K-40 was detected in all indicator and control samples. K-40 is a naturally occurring radionuclide and is found in many environmental sample media.

The 2002 results demonstrate that routine operations of the Nine Mile Point Site resulted in no measurable contribution to the "dose to the public" from the cow/milk pathway.

B. Sampling Overview

Milk samples were collected from five indicator locations and one control location. TS/ODCM require that three sample locations be within five miles of the site. Based on the milk animal census, there were no adequate milk sample locations within five miles of the site in 2002. Samples were collected from five farms located beyond the five mile requirement to ensure the continued monitoring of this important pathway. The five indicator locations ranged from 5.2 to 9.5 miles from the site. The control samples were collected from a farm located 15.6 miles from the site and in a low frequency wind sector (upwind). The geographic location of each sample location is listed below:

Location No.	Direction From Site	Distance (Miles)
76	SE	5.2
50	E	8.2
55	E	9.0
60	E	9.5
4	ESE	7.8
77 (Control)	SSW	13.9

Samples were collected from all locations from April through December, during the first and second half of each month. Samples were not required to be collected during January through March of 2002 as a result of I-131 not detected in samples collected during November and December of 2001 as stipulated in the TS/ODCM.

C. Data Evaluation and Discussion

Each milk sample is analyzed for gamma emitters using gamma spectral analysis. The I-131 analysis is performed using resin extraction followed by spectral analysis for each sample. I-131 and gamma analysis results for milk samples collected during 2002 are provided in Section 6.0, Table 6-11.

Iodine–131 was not detected in any indicator or control milk samples analyzed during 2002. All I-131 milk results were reported as Lower Limits of Detection (LLD). The LLD results for all samples ranged from < 0.34 to < 0.73 pCi/liter. No plant related radionuclides were detected in any milk sample collected in 2002. K-40 was the most abundant radionuclide detected, and found in every indicator and control sample collected. K-40 is a naturally occurring radionuclide and is found in many of the environmental media samples. The K-40 concentration for all milk samples analyzed ranged from 1310 to 2260 pCi/liter. Cs-137 was not detected in any indicator or control milk sample collected in 2002.

D. Dose Evaluation

The calculated dose as a result of plant effluents is not evaluated due to the fact that no plant related radionuclides were detected.

The dose to man from naturally occurring concentrations of K-40 in milk and other environmental media can be calculated. This calculation illustrates that the dose received due to exposure from plant effluents is negligible compared to the dose received from naturally occurring radionuclides. Significant levels of K-40 have been measured in environmental samples. A 70 kilogram (154 pound) adult contains approximately 0.1 microcuries of K-40 as a result of normal life functions (inhalation, consumption, etc.). The dose to bone tissue is about 20 mrem per year as a result of internally deposited naturally occurring K-40.

E. Data Trends

Man made radionuclides are not routinely detected in milk samples. In the past sixteen years, Cs-137 was detected in 1986, 1987, and 1988. The mean Cs-137 indicator activities for those years were 8.6, 6.8 and 10.0 pCi/liter, respectively. I-131 was measured in two milk samples collected in 1997 from a single sample location, having a mean concentration of 0.50 pCi/liter and was of undetermined origin. The previous detection was in 1986 with a mean concentration of 13.6 pCi/liter. The 1986 activity was a result of the Chernobyl accident.

The comparison of 2002 data to historical results over the operating life of the plants shows that Cs-137 and I-131 levels have decreased significantly since 1983.

Historical data of milk sample results for Cs-137 and I-131 are presented in Section 7.0, Tables 7-21 and 7-22.

5.2.6 FOOD PRODUCTS (VEGETATION)

A. Results Summary

There were no plant related radionuclides detected in the 21 food product samples collected and analyzed for the 2002 program.

Detectable levels of naturally occurring K–40 were measured in all control and indicator samples collected for the 2002 program. Ra-226, Be-7 and AcTh-228, all naturally occurring radionuclides were also detected intermittently in all of the samples collected in 2002. These results are consistent with the levels measured in 2001 and previous years.

The results of the 2002 sampling program demonstrate that there is no measurable impact on the dose to the public from the garden pathway as a result of plant operations.

B. Data Analysis and Discussion

Food product samples were collected from four indicator locations and one control location. The indicator locations are represented by nearby gardens in areas of highest D/Q (deposition factor) values based on historical meteorology and an annual garden census. The control location was a garden 15 miles away in a predominately upwind direction.

Food product samples collected during 2002 included only one variety considered to be an edible broadleaf vegetable. Cabbage, an edible broadleaf vegetable, was collected from the control location and from only one indicator location. The general lack of edible broadleaf vegetation samples was the result of grower preference and such varieties were not available in local gardens. Where broadleaf vegetables were not available, non-edible broadleaf vegetation was collected. Non-edible vegetation consisting of squash leaves, grape leaves, and pepper leaves was collected for the 2002 program. The leaves of these plants were sampled as representative of broadleaf vegetation which is a measurement of radionuclide deposition. In addition to the broadleaf vegetation, tomato samples were collected from four locations. Samples were collected during the late summer/fall harvest season. Each sample was analyzed for gamma emitters using gamma spectroscopy.

The analysis of food product samples collected during 2002 did not detect any plant related radionuclides. Results for the past five years also demonstrate that there is no buildup of plant related radionuclides in the garden food products grown in areas close to the site.

Naturally occurring Be-7, K-40, Ra-226 and AcTh-228 were detected in food product samples. The concentration of Be-7 in vegetation samples ranged from 0.15 to 1.29 pCi/g (wet). The concentration of K-40 in indicator and control samples ranged from 2.15 to 10.6 pCi/g (wet). Ra-226 and AcTh-228 were detected intermittently in the samples. The results for naturally occurring radionuclides are consistent with those of prior years. Analytical results for food products are found in Section 6.0, Table 6-12.

C. Dose Evaluation

The calculated dose as a result of plant effluents is not evaluated due to the fact that no plant related radionuclides were detected. The food product sampling program demonstrated no measurable offsite dose to man from this pathway as a result of operations of the plant located at Nine Mile Point.

D. Data Trends

Food product/vegetation sample results for the last five years demonstrate that there is no chronic deposition or buildup of plant related radionuclides in the garden food products in the environs near the site.

In the previous five year period, Cs-137 was detected in 1997 and 1999 at the indicator location. Since 1976, Cs-137 has been detected in ten separate years. Historical Cs-137 mean concentrations over the last twenty years ranged from a maximum of 0.047 pCi/g (wet) in 1985 to a minimum of 0.008 pCi/g (wet) in 1999. The trend for Cs-137 is a general reduction in concentration to a baseline concentration in the range of 0.01 to 0.012 pCi/g (wet), that is a residual from past atmospheric weapons testing.

Historical data of food product results are presented in Section 7.0, Tables 7-23 and 7-24.

5.2.7 LAND USE CENSUS RESULTS

A. Results Summary

The TS/ODCM require that an annual land use census be performed to identify potential new locations for milk sampling and for calculating the dose to man from plant effluents. In 2002, a milk animal census, a nearest resident census and a garden survey were performed.

No changes were required to the 2002 milk sampling program indicator or control locations based on the 2002 milk animal census.

The results of the closest residence census conducted in 2002 required no change to either the NMPNS Unit 1 or Unit 2 Off-site Dose Calculation Manual's (ODCM) closest resident location.

A garden census, not required by TS/ODCM, is performed to identify appropriate garden sampling locations and dose calculation receptors. Garden samples were collected from a number of locations listed in Table 5-1 of the Unit 1 and Unit 2 ODCMs and identified in the census as active for 2002. See Table 3.3-1 for 2002 sampling locations.

B. Data Evaluation and Discussion

A land use census is conducted each year to determine the utilization of land in the vicinity of the Nine Mile Point site. The land use census consists of two types of surveys. A milk animal census is conducted to identify all milk animals within a distance of 10 miles from the site. The census, covering areas out to a distance of 10 miles exceeds the 5 mile distance required by the TS/ODCM. A resident census is conducted and is designed to identify the nearest resident in each meteorological sector out to a distance of 5 miles.

The milk animal census is an estimation of the number of cows and goats within an approximate 10 mile radius of the Nine Mile Point Site. The annual census is conducted during the first half of the grazing season by sending questionnaires to previous milk animal owners and also by road surveys to locate any possible new locations. In the event the questionnaires are not answered, the owners are contacted by telephone or in person. The local county agricultural agency is also

contacted as an additional source of information concerning new milk animal locations in the vicinity of the site.

The number of milk animals located within an approximate 10 mile radius of the site was estimated to be 679 cows and 4 goats based on the 2002 land use census. The number of cows has decreased by 78 and the number of goats has remained the same with respect to the 2001 census. The goats identified during the census were not milking goats.

The results of the milk animal census are found in Section 6.0, Table 6-13.

The second type of census conducted is a residence census. The census is conducted in order to identify the closest residence within 5 miles in each of the 22.5 degree land based meteorological sectors. There are only eight sectors over land where residences are located within 5 miles. The water sectors include: N, NNE, NE, ENE, W, WNW, NW and NNW. The results of the residence census, showing the applicable sectors and degrees and distance of each of the nearest residence, are found in Section 6.0, Table 6-14. No changes were identified in the 2002 census for the closest resident in the land based meteorological sectors.

The nearest resident locations are illustrated in Section 3.3, Figure 3.3-5.

5.3 CONCLUSION

The Radiological Environmental Monitoring Program (REMP) is an ongoing program implemented to measure and document the radiological impact of NMPNS operations on the local environment. The program is designed to detect and evaluate small changes in the radiological environment surrounding the site. Environmental media representing food sources consumed at the higher levels of the food chain, such as fish, food products and milk, are part of a comprehensive sampling program. Results of all samples are reviewed closely to determine any possible impact to the environment or to man. In addition, program results are evaluated for possible short and long term historical trends.

The federal government has established dose limits to protect the public from radiation and radioactivity. The Nuclear Regulatory Commission (NRC) specifies a whole body dose limit of 100 mrem/yr to be received by the maximum exposed member of the general public. This limit is set forth in Section 1301, Part 20, Title 10 of the U.S. Code of Federal Regulations (10CFR20). The Environmental Protection Agency (EPA) limits the annual whole body dose to 25 mrem/yr, which is specified in Section 10, Part 190, Title 40, of the Code of Federal Regulations (40CFR190). Radiation exposure to members of the public, calculated based on the results of the Radiological Environmental Monitoring Program, is extremely small. The dose to members of the public from operations at the Nine Mile Point site, based on environmental measurement and calculations made from effluent releases, is determined to be a fraction of limits set forth by the NRC and EPA.

The results of the 2002 Radiological Environmental Surveillance Program continue to clearly demonstrate that there is no significant short term or chronic long term radiological impact on the environment in the vicinity of the Nine Mile Point site. No unusual radiological characteristics were measured or observed in the local environment. The Environmental Monitoring Program continues to demonstrate that the effluents from the site to the environment contribute no significant or even measurable radiation exposures to the general public as confirmed by the sampling and analysis of environmental media from recognized environmental pathways. Based on TLD results there was no measurable increase in environmental radiation levels beyond the site boundary as a result of the hydrogen water chemistry programs. Environmental radiation levels measured at the nearest residence are at the background level based on control station TLD results. The only measurable radiological impact on the environment continues to be the result of atmospheric weapons testing conducted in the early 1980s and the 1986 accident at the Chernobyl Nuclear Power Plant. Both of these source terms have contributed to a measurable inventory of Cs-137 in the environment. The results for the 2002 sample program demonstrate that the concentrations of manmade radionuclides continue to decline. This reduction in environmental background concentrations

will allow for the site environmental program to become more sensitive to the measurable impact of plant operations on the environment as time goes on.

The environmental monitoring program detected two potentially plant related radionuclides in the sample media collected during 2002. Cs-137 was detected in two shoreline sediment samples and one fish sample. The source of the Cs-137 measured in these samples is considered to be fallout from past atmospheric nuclear weapons testing. The measured concentrations of Cs-137 in each sample, were small and consistent with historical values. The impact of these Cs-137 concentrations are minimal in terms of dose to man. Dose from man made sources in the environment is very small when compared to the dose originating from naturally occurring sources of radioactivity. Small concentrations of tritium were measured in two surface water samples at both an indicator and a distant off-site location. The tritium concentrations are within the historical variation for levels of tritium occurring in Lake Ontario and are not attributed to operation of Nine Mile Point Unit 1 or Unit 2.

Radiation from naturally occurring radionuclides such as K-40 and Ra-226 contributed the vast majority of the total annual dose to members of the general public. The dose to members of the public, resulting from plant operations, is extremely small in comparison to the dose contribution from natural background levels and other radioactivity sources. The whole body dose in Oswego County due to natural sources is approximately 50-60 mrem per individual per year as demonstrated by control environmental TLDs. The fraction of the annual dose to man, attributable to site operation, remains insignificant.

Overall results of the 2002 Radiological Environmental Surveillance Program demonstrate that the levels and variation of radioactivity in the environmental samples were consistent with background levels that would be expected for the NMPNS lakeshore environment.

5.4 REFERENCES

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9. International Commission on Radiological Protection (ICRP), Radionuclide Release into the Environment: Assessment of Doses to Man, ICRP Publication 29, 1979.

10. Glasstone, Samuel and Jordan, Walter H., Nuclear Power and Its Environmental Effects, First Edition, American Nuclear Society, La Grange Park, Ill., 1980.

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SECTION 6.0

REPORT PERIOD ANALYTICAL RESULTS TABLES

6.0 REPORT PERIOD ANALYTICAL RESULTS TABLES

6.1 Environmental sample data is summarized in table format. Tables are provided for select sample media and contain data based on actual values obtained over the year. These values are comprised of both positive values and LLD values where applicable.

6.2 The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability and with 5% probability of falsely concluding that a blank observation represents a "real" signal (see Section 3.7.3 for the equation used to calculate LLD).

6.3 When the initial count of a sample indicates the presence of radioactivity, two recounts are normally performed. When a radionuclide is positively identified in two or more counts, the analytical results for that radionuclide are reported as the mean of the positive detections and the associated error for that mean (see Section 3.7.2 for methodology).

6.4 Many of the tables are footnoted with the term "Plant Radionuclides". Plant related radionuclides are radionuclides that are produced in the reactor during plant operation either through the activation or fission process.

TABLE 6-1

CONCENTRATIONS OF GAMMA EMITTERS IN SHORELINE SEDIMENT SAMPLES - 2002

Results in Units of pCi/g (dry) ± 1 Sigma

SAMPLE LOCATION	COLLECTION DATE	GAMMA EMITTERS					
		K-40	Co-60	Cs-134	Cs-137	Zn-65	OTHERS†
Sunset Bay (05)***	04/24/02	18.4 ± 0.36	<0.048	<0.044	0.053 ± 0.01	<0.072	<LLD
	10/24/02	17.1 ± 0.35	<0.062	<0.060	0.045 ± 0.01	<0.125	<LLD
Lang's Beach (06, Control)***	04/24/02	12.2 ± 0.46	<0.036	<0.037	<0.033	<0.057	<LLD
	10/24/02	14.2 ± 0.41	<0.031	<0.034	<0.032	<0.051	<LLD

† Plant related radionuclides.
*** Corresponds to sample locations noted on Figure 3.3-5.

TABLE 6-2

CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES - 2002

Results in Units of pCi/g (wet) ± 1 Sigma

DATE	TYPE	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	OTHERS†
					FITZPATRICK (03)***					
05/29/02	Smallmouth Bass	4.50 ± 0.34	<0.042	<0.037	<0.085	<0.042	<0.098	<0.031	<0.031	<LLD
05/29/02	Brown Trout	4.43 ± 0.29	<0.027	<0.029	<0.087	<0.035	<0.078	<0.029	<0.032	<LLD
05/29/02	Lake Trout	4.02 ± 0.24	<0.024	<0.031	<0.078	<0.030	<0.066	<0.023	<0.024	<LLD
5/29/02	Walleye	4.72 ± 0.22	<0.021	<0.022	<0.065	<0.024	<0.049	<0.019	<0.023	<LLD
09/05/02	Smallmouth Bass	4.27 ± 0.11	<0.022	<0.024	<0.070	<0.024	<0.057	<0.018	<0.022	<LLD
09/05/02	Brown Trout	5.54 ± 0.24	<0.024	<0.025	<0.078	<0.029	<0.066	<0.016	<0.023	<LLD
09/05/02	Salmon	5.91 ± 0.20	<0.024	<0.024	<0.071	<0.022	<0.031	<0.014	<0.021	<LLD

† Plant related radionuclides.
*** Corresponds to sample location noted on Figure 3.3-5.

TABLE 6-2 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES - 2002

Results in Units of pCi/g (wet) ± 1 Sigma

DATE	TYPE	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	OTHERS †
					NINE MILE POINT (02)***					
05/29/02	Smallmouth Bass	4.30 ± 0.11	<0.021	<0.022	<0.070	<0.018	<0.047	<0.020	<0.020	<LLD
05/29/02	Brown Trout	5.37 ± 0.22	<0.023	<0.024	<0.077	<0.027	<0.065	<0.023	<0.020	<LLD
05/29/02	Lake Trout	4.80 ± 0.14	<0.028	<0.030	<0.081	<0.028	<0.075	<0.021	<0.025	<LLD
06/04/02	Walleye	4.28 ± 0.12	<0.019	<0.019	<0.063	<0.022	<0.054	<0.019	0.02 ± 0.01	<LLD
09/05/02	Smallmouth Bass	3.89 ± 0.24	<0.020	<0.024	<0.092	<0.027	<0.062	<0.023	<0.024	<LLD
09/10/02	Brown Trout	4.78 ± 0.21	<0.020	<0.021	<0.067	<0.022	<0.054	<0.019	<0.020	<LLD
09/10/02	Salmon	4.45 ± 0.20	<0.020	<0.017	<0.056	<0.022	<0.044	<0.012	<0.020	<LLD

† Plant related radionuclides.
*** Corresponds to sample locations noted on Figure 3.3-5.

TABLE 6-2 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES - 2002

Results in Units of pCi/g (wet) ± 1 Sigma

DATE	TYPE	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	OTHERS†
					OSWEGO HARBOR (CONTROL) (00)***					
06/04/02	Smallmouth Bass	4.49 ± 0.36	<0.038	<0.035	<0.070	<0.038	<0.092	<0.032	<0.039	<LLD
05/30/02	Brown Trout	4.31 ± 0.28	<0.028	<0.031	<0.094	<0.026	<0.090	<0.028	<0.032	<LLD
06/04/02	Lake Trout	4.42 ± 0.29	<0.033	<0.028	<0.089	<0.033	<0.077	<0.028	<0.023	<LLD
05/30/02	Walleye	5.21 ± 0.37	<0.039	<0.041	<0.113	<0.040	<0.085	<0.031	<0.030	<LLD
09/13/02	Smallmouth Bass	5.56 ± 0.23	<0.023	<0.023	<0.066	<0.023	<0.056	<0.023	<0.021	<LLD
09/13/02	Brown Trout	5.53 ± 0.19	<0.019	<0.021	<0.051	<0.020	<0.050	<0.013	<0.022	<LLD
09/13/02	Salmon	4.10 ± 0.19	<0.018	<0.019	<0.053	<0.017	<0.044	<0.018	<0.018	<LLD

† Plant related radionuclides.

*** Corresponds to sample location noted on Figure 3.3-5.

TABLE 6-3

CONCENTRATIONS OF TRITIUM IN SURFACE WATER - 2002
(QUARTERLY COMPOSITE SAMPLES)

Results in Units of pCi/liter ± 1 Sigma

STATION CODE	PERIOD	DATE	TRITIUM
FITZPATRICK* (03, INLET)***	First Quarter	1/2/02 - 4/1/02	< 270
	Second Quarter	4/1/02 - 7/2/02	297 ± 85
	Third Quarter	7/2/02 - 10/01/02	< 290
	Fourth Quarter	10/1/02 – 1/2/03	< 270
OSWEGO STEAM* STATION (08, CONTROL)***	First Quarter	12/31/01 - 3/29/02	< 260
	Second Quarter	3/29/02 - 6/28/02	< 270
	Third Quarter	6/28/02 - 9/30/02	< 280
	Fourth Quarter	9/30/02 – 1/2/03	< 270
NINE MILE POINT UNIT 1** (09, INLET)***	First Quarter	12/31/01 - 3/29/02	< 270
	Second Quarter	3/29/02 - 6/28/02	< 270
	Third Quarter	6/28/02 - 9/30/02	< 290
	Fourth Quarter	9/30/02 – 1/2/03	< 270
NINE MILE POINT UNIT 2** (11, INLET)***	First Quarter	12/31/01 - 3/29/02	< 270
	Second Quarter	3/29/02 - 6/28/02	< 270
	Third Quarter	6/28/02 - 9/30/02	< 290
	Fourth Quarter	9/30/02 – 1/2/03	< 270
OSWEGO CITY WATER** (10)***	First Quarter	12/31/01 - 3/29/02	< 260
	Second Quarter	3/29/02 - 6/28/02	268 ± 83
	Third Quarter	6/28/02 - 9/30/02	< 290
	Fourth Quarter	9/30/02 – 1/2/03	< 270

* Sample location required by TS/ODCM.

** Optional sample location.

*** Corresponds to sample location noted on Figure 3.3-4.

TABLE 6-4

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES - 2002
Results in Units of pCi/liter ± 1 Sigma

OSWEGO STEAM STATION* (08, CONTROL)***

NUCLIDE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
I-131	<10.8	<7.50	<10.9	<9.54	<12.5	<6.40
Cs-134	<1.99	<1.53	<3.16	<2.03	<3.19	<2.64
Cs-137	<2.96	<2.64	<2.90	<2.97	<3.01	<2.72
Zr-95	<5.52	<5.65	<6.55	<6.32	<6.61	<5.48
Nb-95	<3.68	<3.44	<4.62	<4.10	<3.97	<3.11
Co-58	<3.38	<3.04	<3.43	<3.63	<3.90	<2.88
Mn-54	<2.95	<2.93	<3.29	<3.33	<2.72	<2.42
Fe-59	<8.88	<8.13	<9.52	<10.9	<11.5	<7.35
Zn-65	<7.17	<6.13	<8.57	<4.81	<8.30	<7.01
Co-60	<3.13	<2.63	<3.70	<3.81	<3.63	<2.64
K-40	189 ± 16.1	179 ± 15.3	332 ± 20.9	361 ± 21.0	173 ± 18.9	222 ± 17.6
Ba/La-140	<8.05	<7.00	<10.0	<8.57	<10.2	<6.82
NUCLIDE	**JULY**	**AUGUST**	**SEPTEMBER**	**OCTOBER**	**NOVEMBER**	**DECEMBER**
I-131	<10.1	<8.65	<10.5	<9.18	<6.38	<6.96
Cs-134	<2.03	<3.02	<2.90	<2.03	<1.43	<2.54
Cs-137	<2.92	<2.63	<2.82	<3.07	<2.27	<2.52
Zr-95	<5.75	<6.51	<6.50	<6.25	<4.12	<5.28
Nb-95	<4.06	<3.68	<4.45	<4.02	<2.65	<3.63
Co-58	<3.53	<3.31	<3.51	<3.57	<2.43	<2.86
Mn-54	<3.16	<3.31	<3.18	<2.96	<2.08	<2.62
Fe-59	<11.3	<10.7	<11.9	<10.5	<5.97	<7.50
Zn-65	<8.15	<8.52	<7.54	<6.95	<2.83	<6.31
Co-60	<3.81	<3.54	<3.54	<3.74	<1.93	<2.95
K-40	394 ± 21.9	330 ± 21.0	291 ± 20.5	400 ± 23.1	238 ± 13.2	190 ± 16.3
Ba/La-140	<8.69	<7.77	<9.54	<9.21	<5.07	<6.51

* Sample location required by TS/ODCM.
*** Corresponds to sample location noted on Figure 3.3-4.

TABLE 6-4 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES - 2002
Results in Units of pCi/liter ± 1 Sigma

FITZPATRICK* (03, INLET)***

NUCLIDE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
I-131	<9.86	<5.81	<8.47	<10.9	<13.1	<12.7
Cs-134	<2.90	<1.38	<2.99	<3.68	<1.99	<4.25
Cs-137	<2.40	<2.10	<2.78	<3.53	<2.89	<3.39
Zr-95	<5.12	<4.47	<5.14	<8.12	<5.89	<6.82
Nb-95	<3.30	<2.86	<3.18	<4.16	<4.49	<4.41
Co-58	<2.92	<2.58	<3.15	<4.80	<3.70	<4.07
Mn-54	<2.73	<2.31	<2.67	<3.92	<3.21	<3.86
Fe-59	<9.04	<6.23	<9.15	<12.2	<10.0	<12.1
Zn-65	<5.79	<2.86	<6.04	<8.71	<8.15	<9.14
Co-60	<3.03	<2.28	<2.55	<3.40	<3.54	<3.55
K-40	170 ± 15.1	262 ± 13.4	96.8 ± 13.2	148 ± 21.4	341 ± 21.1	127 ± 18.3
Ba/La-140	<6.77	<4.20	<6.82	<8.32	<11.1	<10.7
NUCLIDE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
I-131	<9.62	<12.7	<8.83	<6.55	<11.1	<7.36
Cs-134	<1.45	<3.36	<2.73	<1.51	<3.24	<1.65
Cs-137	<2.08	<3.28	<3.09	<3.08	<2.81	<2.72
Zr-95	<4.35	<8.31	<5.67	<5.36	<6.46	<5.67
Nb-95	<3.08	<5.52	<4.21	<3.56	<5.14	<3.49
Co-58	<2.35	<4.12	<3.57	<2.90	<3.79	<2.67
Mn-54	<2.10	<3.87	<3.11	<2.33	<3.34	<2.73
Fe-59	<8.05	<10.9	<11.4	<9.53	<11.1	<8.28
Zn-65	<2.94	<8.38	<7.61	<6.41	<7.66	<6.36
Co-60	<1.84	<3.43	<3.20	<2.52	<3.43	<2.87
K-40	273 ± 14.0	199 ± 22.1	325 ± 21.7	160 ± 15.2	171 ± 22.4	212 ± 17.5
Ba/La-140	<6.34	<10.7	<7.88	<7.03	<9.57	<7.21

* Sample location required by TS/ODCM.
*** Corresponds to sample location noted on Figure 3.3-4.

TABLE 6-4 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES - 2002
Results in Units of pCi/liter ± 1 Sigma

NINE MILE POINT UNIT 1** (09, INLET)***

NUCLIDE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
I-131	<12.0	<8.29	<9.95	<7.55	<14.3	<7.11
Cs-134	<2.12	<3.46	<2.06	<2.73	<3.65	<3.06
Cs-137	<2.93	<3.72	<2.94	<2.57	<3.69	<2.72
Zr-95	<6.56	<6.80	<5.18	<5.11	<6.68	<5.49
Nb-95	<4.16	<3.83	<3.62	<3.34	<5.36	<3.33
Co-58	<3.73	<3.81	<3.07	<2.99	<4.41	<2.92
Mn-54	<3.37	<3.82	<2.79	<2.42	<4.55	<3.07
Fe-59	<12.1	<11.0	<9.72	<7.91	<13.9	<10.0
Zn-65	<8.62	<7.08	<6.47	<6.10	<9.07	<5.28
Co-60	<4.04	<4.11	<2.66	<2.80	<3.92	<3.29
K-40	351 ± 21.5	209 ± 23.6	139 ± 14.8	155 ± 15.4	206 ± 25.1	144 ± 14.5
Ba/La-140	<8.37	<9.37	<7.99	<6.32	<9.78	<6.19
NUCLIDE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
I-131	<7.42	<9.53	<7.65	<7.30	<7.47	<9.58
Cs-134	<2.75	<3.43	<1.48	<2.62	<2.92	<3.54
Cs-137	<2.61	<3.11	<2.33	<2.97	<2.74	<3.41
Zr-95	<5.44	<7.57	<4.07	<4.85	<5.05	<6.51
Nb-95	<3.36	<4.28	<3.04	<3.29	<3.40	<4.75
Co-58	<3.08	<4.11	<2.45	<2.63	<2.64	<3.83
Mn-54	<2.44	<3.66	<2.07	<2.78	<3.00	<3.17
Fe-59	<8.49	<11.3	<6.43	<8.80	<8.63	<11.4
Zn-65	<5.89	<6.99	<2.83	<6.61	<5.96	<7.25
Co-60	<2.72	<4.14	<1.90	<3.11	<2.65	<3.89
K-40	152 ± 16.0	167 ± 21.0	229 ± 13.0	179 ± 16.0	137 ± 14.4	241 ± 22.4
Ba/La-140	<7.32	<7.92	<5.75	<7.78	<7.21	<8.72

** Optional sample location.
*** Corresponds to sample location noted on Figure 3.3-4.

TABLE 6-4 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES - 2002
Results in Units of pCi/liter ± 1 Sigma

NINE MILE POINT UNIT 2** (11, INLET)***

NUCLIDE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
I-131	<9.96	<7.22	<9.19	<8.53	<11.4	<8.20
Cs-134	<2.46	<2.85	<2.60	<2.71	<3.45	<3.42
Cs-137	<2.36	<2.61	<2.54	<2.52	<3.00	<2.96
Zr-95	<6.12	<5.18	<4.52	<5.31	<6.38	<5.90
Nb-95	<3.79	<3.02	<3.32	<3.90	<3.70	<3.77
Co-58	<3.19	<2.85	<3.25	<3.27	<3.49	<3.26
Mn-54	<2.78	<2.81	<2.93	<2.77	<3.09	<3.36
Fe-59	<9.40	<8.88	<8.46	<9.26	<10.1	<8.98
Zn-65	<5.63	<6.25	<5.66	<6.17	<6.19	<8.26
Co-60	<3.19	<2.80	<2.73	<3.15	<2.93	<3.41
K-40	212 ± 16.5	120 ± 14.6	141 ± 15.0	150 ± 15.1	97.3 ± 14.6	365 ± 22.8
Ba/La-140	<9.28	<6.93	<6.96	<6.41	<10.3	<7.50

NUCLIDE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
I-131	<8.18	<7.57	<8.28	<7.84	<10.3	<7.99
Cs-134	<2.53	<3.00	<2.79	<1.61	<3.43	<2.94
Cs-137	<2.49	<2.54	<2.59	<2.43	<3.21	<2.72
Zr-95	<5.38	<5.51	<5.45	<5.52	<8.22	<4.86
Nb-95	<3.17	<3.43	<3.68	<3.64	<4.65	<3.44
Co-58	<3.10	<2.84	<2.79	<3.24	<3.78	<2.89
Mn-54	<2.47	<2.84	<2.62	<2.41	<3.42	<2.86
Fe-59	<8.62	<8.17	<8.73	<9.23	<12.4	<9.93
Zn-65	<6.24	<6.14	<6.25	<5.93	<8.19	<6.27
Co-60	<2.99	<2.75	<2.68	<2.82	<3.52	<2.80
K-40	213 ± 16.2	151 ± 14.8	187 ± 16.3	156 ± 15.3	161 ± 18.2	135 ± 14.2
Ba/La-140	<6.65	<7.14	<8.88	<6.73	<9.61	<6.58

** Optional sample location.
*** Corresponds to sample location noted on Figure 3.3-4.

TABLE 6-4 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES - 2002
Results in Units of pCi/liter ± 1 Sigma

OSWEGO CITY WATER** (10)***

NUCLIDE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
I-131	<12.6	<7.88	<8.89	<6.86	<13.7	<10.2
Cs-134	<2.14	<1.95	<2.76	<1.43	<3.54	<1.94
Cs-137	<3.02	<2.78	<3.01	<2.18	<3.19	<3.02
Zr-95	<6.50	<6.23	<5.58	<4.50	<7.40	<6.59
Nb-95	<4.81	<3.98	<3.30	<3.12	<4.69	<4.19
Co-58	<3.81	<3.57	<2.82	<2.69	<4.03	<3.59
Mn-54	<3.13	<3.18	<2.65	<2.17	<3.23	<3.15
Fe-59	<10.5	<10.6	<9.30	<6.69	<14.4	<9.52
Zn-65	<8.25	<7.84	<6.97	<2.89	<7.92	<8.14
Co-60	<3.58	<3.62	<3.05	<2.27	<3.75	<3.20
K-40	385 ± 23.3	370 ± 21.8	141 ± 15.7	260 ± 13.7	331 ± 24.8	355 ± 21.0
Ba/La-140	<10.4	<7.39	<8.35	<5.50	<12.0	<8.07
NUCLIDE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
I-131	<11.3	<6.24	<11.7	<6.85	<6.57	<7.88
Cs-134	<3.65	<1.42	<3.59	<1.44	<2.45	<3.03
Cs-137	<3.78	<2.15	<3.63	<2.13	<2.72	<2.75
Zr-95	<7.01	<4.18	<7.03	<4.02	<5.23	<5.78
Nb-95	<4.82	<2.51	<5.21	<2.84	<3.03	<3.81
Co-58	<3.90	<2.39	<4.17	<2.49	<2.77	<3.31
Mn-54	<3.72	<2.20	<4.15	<2.11	<2.57	<3.08
Fe-59	<13.3	<5.88	<12.8	<5.78	<8.93	<10.1
Zn-65	<8.34	<4.88	<7.42	<2.99	<6.48	<3.75
Co-60	<4.15	<2.26	<3.53	<2.16	<2.80	<3.81
K-40	167 ± 19.8	250 ± 13.4	213 ± 20.5	256 ± 13.9	164 ± 15.6	377 ± 22.5
Ba/La-140	<10.1	<4.96	<11.1	<4.84	<5.99	<7.70

** Optional sample location.
*** Corresponds to sample location noted on Figure 3.3-4.

TABLE 6-5

NMPNS/JAF SITE
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES – OFF SITE STATIONS - 2002
GROSS BETA ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	R-1* OFF-SITE	R-2* OFF-SITE	R-3* OFF-SITE	R-4* OFF-SITE	R-5* OFF-SITE	D-2** OFF-SITE	E** OFF-SITE	F** OFF-SITE	G** OFF-SITE
01/02/02	0.0215 ± 0.002	0.0236 ± 0.002	0.0206 ± 0.002	0.0210 ± 0.002	0.0221 ± 0.002	0.0202 ± 0.002	0.0213 ± 0.002	0.0193 ± 0.002	0.0181 ± 0.002
01/08/02	0.0167 ± 0.002	0.0140 ± 0.001	0.0150 ± 0.002	0.0146 ± 0.002	0.0150 ± 0.002	0.0130 ± 0.002	0.0153 ± 0.002	0.0158 ± 0.002	0.0148 ± 0.001
01/15/02	0.0134 ± 0.002	0.0134 ± 0.001	0.0108 ± 0.001	0.0164 ± 0.002	0.0130 ± 0.002	0.0121 ± 0.002	0.0155 ± 0.002	0.0132 ± 0.001	0.0122 ± 0.001
01/22/02	0.0228 ± 0.002	0.0228 ± 0.002	0.0189 ± 0.002	0.0224 ± 0.002	0.0236 ± 0.002	0.0179 ± 0.002	0.0243 ± 0.002	0.0209 ± 0.002	0.0200 ± 0.002
01/29/02	0.0136 ± 0.002	0.0159 ± 0.002	0.0163 ± 0.002	0.0173 ± 0.002	0.0172 ± 0.002	0.0164 ± 0.002	0.0176 ± 0.002	0.0149 ± 0.002	0.0131 ± 0.001
02/05/02	0.0241 ± 0.002	0.0250 ± 0.002	0.0239 ± 0.002	0.0250 ± 0.002	0.0266 ± 0.002	0.0200 ± 0.002	0.0263 ± 0.002	0.0238 ± 0.002	0.0211 ± 0.002
02/12/02	0.0131 ± 0.002	0.0144 ± 0.001	0.0120 ± 0.001	0.0119 ± 0.001	0.0128 ± 0.002	0.0138 ± 0.002	0.0155 ± 0.002	0.0122 ± 0.001	0.0105 ± 0.001
02/19/02	0.0164 ± 0.002	0.0147 ± 0.002	0.0163 ± 0.002	0.0149 ± 0.002	0.0145 ± 0.002	0.0168 ± 0.002	0.0144 ± 0.002	0.0141 ± 0.001	0.0138 ± 0.001
02/26/02	0.0160 ± 0.002	0.0124 ± 0.001	0.0132 ± 0.002	0.0142 ± 0.002	0.0163 ± 0.002	0.0179 ± 0.002	0.0123 ± 0.002	0.0142 ± 0.001	0.0128 ± 0.001
03/05/02	0.0192 ± 0.002	0.0196 ± 0.002	0.0201 ± 0.002	0.0214 ± 0.002	0.0229 ± 0.002	0.0186 ± 0.002	0.0230 ± 0.002	0.0198 ± 0.002	0.0210 ± 0.002
03/12/02	0.0195 ± 0.002	0.0153 ± 0.002	0.0181 ± 0.002	0.0201 ± 0.002	0.0197 ± 0.002	0.0165 ± 0.002	0.0191 ± 0.002	0.0192 ± 0.002	0.0165 ± 0.002
03/19/02	0.0144 ± 0.002	0.0111 ± 0.001	0.0140 ± 0.002	0.0159 ± 0.002	0.0153 ± 0.002	0.0178 ± 0.002	0.0136 ± 0.002	0.0133 ± 0.002	0.0102 ± 0.001
03/26/02	0.0148 ± 0.002	0.0137 ± 0.001	0.0137 ± 0.002	0.0134 ± 0.001	0.0139 ± 0.002	0.0137 ± 0.002	0.0129 ± 0.002	0.0144 ± 0.002	0.0129 ± 0.001
04/02/02	0.0200 ± 0.002	0.0152 ± 0.002	0.0193 ± 0.002	0.0163 ± 0.002	0.0185 ± 0.002	0.0141 ± 0.002	0.0193 ± 0.002	0.0173 ± 0.002	0.0150 ± 0.001
04/09/02	0.0151 ± 0.002	0.0132 ± 0.001	0.0156 ± 0.002	0.0147 ± 0.002	0.0122 ± 0.002	0.0146 ± 0.002	0.0118 ± 0.002	0.0136 ± 0.002	0.0159 ± 0.001
04/16/02	0.0185 ± 0.002	0.0207 ± 0.002	0.0177 ± 0.002	0.0197 ± 0.002	0.0185 ± 0.002	0.0205 ± 0.002	0.0204 ± 0.002	0.0175 ± 0.002	0.0182 ± 0.002
04/23/02	0.0150 ± 0.002	0.0155 ± 0.002	0.0157 ± 0.002	0.0137 ± 0.002	0.0146 ± 0.002	0.0166 ± 0.002	0.0142 ± 0.002	0.0164 ± 0.002	0.0145 ± 0.001
04/30/02	0.0121 ± 0.002	0.0118 ± 0.002	0.0114 ± 0.001	0.0143 ± 0.002	0.0111 ± 0.002	0.0140 ± 0.002	0.0145 ± 0.002	0.0126 ± 0.002	0.0127 ± 0.001
05/07/02	0.0077 ± 0.001	0.0075 ± 0.001	0.0126 ± 0.001	0.0085 ± 0.001	0.0097 ± 0.001	0.0098 ± 0.002	0.0101 ± 0.002	0.0090 ± 0.001	0.0087 ± 0.001
05/14/02	0.0071 ± 0.001	0.0102 ± 0.001	0.0066 ± 0.001	0.0114 ± 0.002	0.0087 ± 0.001	0.0095 ± 0.001	0.0096 ± 0.001	0.0090 ± 0.001	0.0088 ± 0.001
05/21/02	0.0135 ± 0.002	0.0120 ± 0.001	0.0110 ± 0.001	0.0107 ± 0.001	0.0110 ± 0.001	0.0121 ± 0.002	0.0118 ± 0.002	0.0112 ± 0.001	0.0114 ± 0.001
05/28/02	0.0125 ± 0.002	0.0123 ± 0.001	0.0123 ± 0.001	0.0143 ± 0.002	0.0155 ± 0.002	0.0146 ± 0.002	0.0148 ± 0.002	0.0161 ± 0.002	0.0171 ± 0.002
06/04/02	0.0133 ± 0.002	0.0129 ± 0.002	0.0144 ± 0.002	0.0132 ± 0.002	0.0151 ± 0.002	0.0127 ± 0.001	0.0142 ± 0.002	0.0139 ± 0.002	0.0141 ± 0.002
06/11/02	0.0080 ± 0.001	0.0058 ± 0.001	0.0069 ± 0.001	0.0066 ± 0.001	0.0075 ± 0.001	0.0074 ± 0.001	0.0073 ± 0.001	0.0097 ± 0.001	0.0081 ± 0.001
06/18/02	0.0178 ± 0.002	0.0229 ± 0.002	0.0216 ± 0.002	0.0179 ± 0.002	0.0208 ± 0.002	0.0193 ± 0.002	0.0200 ± 0.002	0.0188 ± 0.002	0.0210 ± 0.002
06/25/02	0.0201 ± 0.002	0.0242 ± 0.002	0.0220 ± 0.002	0.0207 ± 0.002	0.0251 ± 0.002	0.0228 ± 0.002	0.0267 ± 0.002	0.0213 ± 0.002	0.0259 ± 0.002

* Sample location required by TS/ODCM.
** Optional sample location.

TABLE 6-5 (continued)

NMPNS/JAF SITE

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES – OFFSITE STATIONS - 2002

GROSS BETA ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	R-1* OFF-SITE	R-2* OFF-SITE	R-3* OFF-SITE	R-4* OFF-SITE	R-5* OFF-SITE	D-2** OFF-SITE	E** OFF-SITE	F** OFF-SITE	G** OFF-SITE
07/02/02	0.0263 ± 0.002	0.0228 ± 0.002	0.0239 ± 0.002	0.0250 ± 0.002	0.0219 ± 0.002	0.0232 ± 0.002	0.0219 ± 0.002	0.0204 ± 0.002	0.0208 ± 0.002
07/09/02	0.0152 ± 0.002	0.0204 ± 0.002	0.0167 ± 0.002	0.0154 ± 0.002	0.0172 ± 0.002	0.0164 ± 0.002	0.0185 ± 0.002	0.0156 ± 0.002	0.0150 ± 0.002
07/16/02	0.0194 ± 0.002	0.0201 ± 0.002	0.0195 ± 0.002	0.0197 ± 0.002	0.0188 ± 0.002	0.0215 ± 0.002	0.0220 ± 0.002	0.0161 ± 0.002	0.0205 ± 0.002
07/23/02	0.0135 ± 0.002	0.0111 ± 0.001	0.0123 ± 0.001	0.0133 ± 0.002	0.0127 ± 0.001	0.0115 ± 0.001	0.0132 ± 0.001	0.0138 ± 0.001	0.0138 ± 0.002
07/30/02	0.0205 ± 0.002	0.0169 ± 0.002	0.0174 ± 0.002	0.0195 ± 0.002	0.0196 ± 0.002	0.0210 ± 0.002	0.0204 ± 0.002	0.0187 ± 0.002	0.0195 ± 0.002
08/06/02	0.0145 ± 0.002	0.0170 ± 0.002	0.0163 ± 0.002	0.0168 ± 0.002	0.0176 ± 0.002	0.0163 ± 0.002	0.0151 ± 0.002	0.0186 ± 0.002	0.0177 ± 0.002
08/13/02	0.0193 ± 0.002	0.0210 ± 0.002	0.0217 ± 0.002	0.0223 ± 0.002	0.0266 ± 0.002	0.0238 ± 0.002	0.0218 ± 0.002	0.0228 ± 0.002	0.0212 ± 0.002
08/20/02	0.0154 ± 0.002	0.0138 ± 0.002	0.0136 ± 0.001	0.0112 ± 0.001	0.0140 ± 0.002	0.0151 ± 0.002	0.0136 ± 0.001	0.0148 ± 0.002	0.0131 ± 0.001
08/27/02	0.0112 ± 0.001	0.0111 ± 0.001	0.0104 ± 0.001	0.0112 ± 0.001	0.0123 ± 0.001	0.0117 ± 0.001	0.0162 ± 0.002	0.0109 ± 0.001	0.0100 ± 0.001
09/03/02	0.0167 ± 0.002	0.0175 ± 0.002	0.0181 ± 0.002	0.0181 ± 0.002	0.0189 ± 0.002	0.0190 ± 0.002	0.0171 ± 0.002	0.0162 ± 0.002	0.0212 ± 0.002
09/10/02	0.0205 ± 0.002	0.0230 ± 0.002	0.0250 ± 0.002	0.0215 ± 0.002	0.0201 ± 0.002	0.0240 ± 0.002	0.0231 ± 0.002	0.0185 ± 0.002	0.0211 ± 0.002
09/17/02	0.0234 ± 0.002	0.0232 ± 0.002	0.0243 ± 0.002	0.0204 ± 0.002	0.0240 ± 0.002	0.0215 ± 0.002	0.0198 ± 0.002	0.0209 ± 0.002	0.0225 ± 0.002
09/24/02	0.0193 ± 0.002	0.0189 ± 0.002	0.0225 ± 0.002	0.0194 ± 0.002	0.0222 ± 0.002	0.0223 ± 0.002	0.0212 ± 0.002	0.0206 ± 0.002	0.0216 ± 0.002
10/01/02	0.0175 ± 0.002	0.0151 ± 0.002	0.0149 ± 0.002	0.0131 ± 0.002	0.0151 ± 0.002	0.0147 ± 0.002	0.0168 ± 0.002	0.0156 ± 0.002	0.0160 ± 0.002
10/08/02	0.0139 ± 0.001	0.0116 ± 0.001	0.0135 ± 0.001	0.0131 ± 0.001	0.0098 ± 0.001	0.0125 ± 0.001	0.0122 ± 0.001	0.0131 ± 0.001	0.0126 ± 0.001
10/15/02	0.0101 ± 0.001	0.0100 ± 0.001	0.0105 ± 0.001	0.0103 ± 0.001	0.0108 ± 0.001	0.0105 ± 0.001	0.0114 ± 0.002	0.0085 ± 0.001	0.0120 ± 0.001
10/22/02	0.0111 ± 0.001	0.0121 ± 0.001	0.0108 ± 0.001	0.0122 ± 0.001	0.0105 ± 0.001	0.0144 ± 0.002	0.0104 ± 0.001	0.0121 ± 0.001	0.0112 ± 0.001
10/29/02	0.0108 ± 0.001	0.0117 ± 0.001	0.0106 ± 0.001	0.0120 ± 0.001	0.0136 ± 0.002	0.0127 ± 0.002	0.0146 ± 0.002	0.0120 ± 0.001	0.0140 ± 0.001
11/05/02	0.0249 ± 0.002	0.0232 ± 0.002	0.0247 ± 0.002	0.0217 ± 0.002	0.0211 ± 0.002	0.0216 ± 0.002	0.0216 ± 0.002	0.0217 ± 0.002	0.0239 ± 0.002
11/12/02	0.0164 ± 0.002	0.0150 ± 0.002	0.0160 ± 0.002	0.0133 ± 0.001	0.0135 ± 0.001	0.0147 ± 0.002	0.0139 ± 0.001	0.0147 ± 0.001	0.0168 ± 0.002
11/19/02	0.0114 ± 0.001	0.0148 ± 0.002	0.0155 ± 0.002	0.0127 ± 0.001	0.0146 ± 0.002	0.0138 ± 0.001	0.0120 ± 0.001	0.0159 ± 0.002	0.0166 ± 0.002
11/26/02	0.0126 ± 0.001	0.0142 ± 0.001	0.0102 ± 0.001	0.0094 ± 0.001	0.0102 ± 0.001	0.0115 ± 0.001	0.0132 ± 0.001	0.0108 ± 0.001	0.0112 ± 0.001
12/03/02	0.0204 ± 0.002	0.0185 ± 0.002	0.0199 ± 0.002	0.0193 ± 0.002	0.0195 ± 0.002	0.0172 ± 0.002	0.0186 ± 0.002	0.0221 ± 0.002	0.0189 ± 0.002
12/10/02	0.0177 ± 0.002	0.0191 ± 0.002	0.0168 ± 0.002	0.0198 ± 0.002	0.0186 ± 0.002	0.0152 ± 0.002	0.0168 ± 0.002	0.0201 ± 0.002	0.0148 ± 0.002
12/17/02	0.0105 ± 0.001	0.0105 ± 0.002	0.0102 ± 0.001	0.0150 ± 0.002	0.0110 ± 0.002	0.0130 ± 0.002	0.0133 ± 0.002	0.0117 ± 0.002	0.0097 ± 0.001
12/23/02	0.0151 ± 0.001	0.0161 ± 0.001	0.0119 ± 0.001	0.0163 ± 0.002	0.0190 ± 0.002	0.0168 ± 0.001	0.0129 ± 0.001	0.0147 ± 0.001	0.0144 ± 0.001

* Sample location required by TS/ODCM.
** Optional sample location.

TABLE 6-6

NMPNS/JAF SITE
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE STATIONS - 2002
GROSS BETA ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	D1** ON-SITE	G** ON-SITE	H** ON-SITE	I** ON-SITE	J** ON-SITE	K** ON-SITE
12/31/01	0.0205 ± 0.002	0.0155 ± 0.001	0.0196 ± 0.002	0.0191 ± 0.002	0.0185 ± 0.002	0.0173 ± 0.002
01/07/02	0.0166 ± 0.002	0.0167 ± 0.002	0.0140 ± 0.002	0.0210 ± 0.002	0.0153 ± 0.002	0.0165 ± 0.002
01/14/02	0.0164 ± 0.002	0.0120 ± 0.001	0.0147 ± 0.002	0.0154 ± 0.002	0.0143 ± 0.002	0.0109 ± 0.001
01/21/02	0.0212 ± 0.002	0.0202 ± 0.002	0.0204 ± 0.002	0.0214 ± 0.002	0.0210 ± 0.002	0.0203 ± 0.002
01/28/02	0.0161 ± 0.002	0.0186 ± 0.002	0.0170 ± 0.002	0.0165 ± 0.002	0.0159 ± 0.002	0.0154 ± 0.002
02/04/02	0.0235 ± 0.002	0.0261 ± 0.002	0.0249 ± 0.002	0.0248 ± 0.002	0.0224 ± 0.002	0.0216 ± 0.002
02/11/02	0.0160 ± 0.001	0.0145 ± 0.001	0.0150 ± 0.001	0.0157 ± 0.001	0.0142 ± 0.001	0.0146 ± 0.001
02/19/02	0.0145 ± 0.002	0.0138 ± 0.002	0.0171 ± 0.002	0.0135 ± 0.002	0.0150 ± 0.002	0.0112 ± 0.002
02/25/02	0.0171 ± 0.002	0.0155 ± 0.002	0.0163 ± 0.002	0.0161 ± 0.002	0.0175 ± 0.002	0.0148 ± 0.002
03/04/02	0.0232 ± 0.002	0.0199 ± 0.002	0.0199 ± 0.002	0.0189 ± 0.002	0.0190 ± 0.002	0.0177 ± 0.002
03/11/02	0.0233 ± 0.002	0.0210 ± 0.002	0.0180 ± 0.002	0.0199 ± 0.002	0.0197 ± 0.002	0.0189 ± 0.002
03/18/02	0.0117 ± 0.002	0.0114 ± 0.001	0.0118 ± 0.002	0.0129 ± 0.002	0.0104 ± 0.002	0.0102 ± 0.002
03/25/02	0.0162 ± 0.002	0.0154 ± 0.002	0.0146 ± 0.002	0.0131 ± 0.001	0.0149 ± 0.002	0.0145 ± 0.002
04/01/02	0.0153 ± 0.002	0.0140 ± 0.001	0.0142 ± 0.002	0.0160 ± 0.002	0.0157 ± 0.002	0.0183 ± 0.002
04/08/02	0.0175 ± 0.002	0.0125 ± 0.001	0.0149 ± 0.002	0.0127 ± 0.001	0.0133 ± 0.002	0.0179 ± 0.002
04/15/02	0.0187 ± 0.002	0.0213 ± 0.002	0.0179 ± 0.002	0.0188 ± 0.002	0.0182 ± 0.002	0.0177 ± 0.002
04/22/02	0.0143 ± 0.002	0.0153 ± 0.002	0.0140 ± 0.002	0.0157 ± 0.002	0.0148 ± 0.002	0.0130 ± 0.002
04/29/02	0.0104 ± 0.002	0.0112 ± 0.001	0.0120 ± 0.002	0.0125 ± 0.002	0.0128 ± 0.002	0.0123 ± 0.002
05/06/02	0.0135 ± 0.002	0.0108 ± 0.001	0.0135 ± 0.002	0.0124 ± 0.002	0.0122 ± 0.002	0.0135 ± 0.002
05/13/02	0.0090 ± 0.001	0.0108 ± 0.001	0.0109 ± 0.002	0.0077 ± 0.001	0.0073 ± 0.001	0.0089 ± 0.001
05/20/02	0.0093 ± 0.001	0.0103 ± 0.001	0.0119 ± 0.001	0.0087 ± 0.001	0.0106 ± 0.001	0.0079 ± 0.001
05/28/02	0.0122 ± 0.002	0.0144 ± 0.002	0.0169 ± 0.002	0.0190 ± 0.002	0.0143 ± 0.002	0.0180 ± 0.002
06/03/02	0.0094 ± 0.002	0.0105 ± 0.001	0.0119 ± 0.001	0.0090 ± 0.001	0.0114 ± 0.002	0.0101 ± 0.002
06/10/02	0.0092 ± 0.001	0.0103 ± 0.001	0.0068 ± 0.001	0.0067 ± 0.001	0.0085 ± 0.001	0.0080 ± 0.001
06/17/02	0.0149 ± 0.001	0.0202 ± 0.002	0.0166 ± 0.001	0.0178 ± 0.002	0.0164 ± 0.002	0.0155 ± 0.002
06/24/02	0.0168 ± 0.002	0.0162 ± 0.002	0.0169 ± 0.002	0.0173 ± 0.002	0.0214 ± 0.002	0.0194 ± 0.002

** Optional sample location.

TABLE 6-6 (continued)

NMPNS/JAF SITE
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE STATIONS - 2002

GROSS BETA ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	D1** ON-SITE	G** ON-SITE	H** ON-SITE	I** ON-SITE	J** ON-SITE	K** ON-SITE
07/01/02	0.0224 ± 0.002	0.0205 ± 0.002	0.0226 ± 0.002	0.0214 ± 0.002	0.0258 ± 0.002	0.0206 ± 0.002
07/08/02	0.0146 ± 0.001	0.0153 ± 0.002	0.0165 ± 0.002	0.0152 ± 0.001	0.0153 ± 0.001	0.0202 ± 0.002
07/15/02	0.0330 ± 0.002	0.0204 ± 0.002	0.0181 ± 0.002	0.0187 ± 0.002	0.0214 ± 0.002	0.0208 ± 0.002
07/22/02	0.0118 ± 0.001	0.0143 ± 0.002	0.0138 ± 0.001	0.0132 ± 0.002	0.0125 ± 0.001	0.0140 ± 0.002
07/29/02	0.0198 ± 0.002	0.0208 ± 0.002	0.0220 ± 0.002	0.0204 ± 0.002	0.0177 ± 0.002	0.0188 ± 0.002
08/05/02	0.0111 ± 0.001	0.0122 ± 0.001	0.0139 ± 0.001	0.0133 ± 0.001	0.0138 ± 0.001	0.0139 ± 0.001
08/12/02	0.0249 ± 0.002	0.0243 ± 0.002	0.0231 ± 0.002	0.0232 ± 0.002	0.0249 ± 0.002	0.0240 ± 0.002
08/19/02	0.0115 ± 0.001	0.0130 ± 0.002	0.0170 ± 0.002	0.0101 ± 0.001	0.0091 ± 0.001	0.0114 ± 0.001
08/26/02	0.0118 ± 0.001	0.0130 ± 0.001	0.0108 ± 0.001	0.0144 ± 0.001	0.0131 ± 0.001	0.0108 ± 0.001
09/03/02	0.0166 ± 0.002	0.0169 ± 0.002	0.0176 ± 0.002	0.0145 ± 0.002	0.0157 ± 0.002	0.0170 ± 0.002
09/09/02	0.0244 ± 0.002	0.0205 ± 0.002	0.0200 ± 0.002	0.0221 ± 0.002	0.0231 ± 0.002	0.0212 ± 0.002
09/16/02	0.0203 ± 0.002	0.0180 ± 0.002	0.0201 ± 0.002	0.0206 ± 0.002	0.0233 ± 0.002	0.0195 ± 0.002
09/23/02	0.0203 ± 0.002	0.0211 ± 0.002	0.0185 ± 0.002	0.0200 ± 0.002	0.0169 ± 0.002	0.0198 ± 0.002
09/30/02	0.0177 ± 0.002	0.0176 ± 0.002	0.0184 ± 0.002	0.0189 ± 0.002	0.0205 ± 0.002	0.0200 ± 0.002
10/07/02	0.0128 ± 0.001	0.0122 ± 0.002	0.0118 ± 0.001	0.0108 ± 0.001	0.0090 ± 0.001	0.0096 ± 0.001
10/14/02	0.0090 ± 0.001	0.0120 ± 0.001	0.0099 ± 0.001	0.0086 ± 0.001	0.0084 ± 0.001	0.0095 ± 0.001
10/21/02	0.0080 ± 0.001	0.0106 ± 0.001	0.0121 ± 0.001	0.0106 ± 0.001	0.0104 ± 0.001	0.0097 ± 0.001
10/28/02	0.0097 ± 0.001	0.0085 ± 0.001	0.0095 ± 0.001	0.0091 ± 0.001	0.0084 ± 0.001	0.0110 ± 0.001
11/04/02	0.0235 ± 0.002	0.0231 ± 0.002	0.0233 ± 0.002	0.0234 ± 0.002	0.0272 ± 0.002	0.0238 ± 0.002
11/12/02	0.0143 ± 0.002	0.0151 ± 0.002	0.0152 ± 0.002	0.0144 ± 0.002	0.0167 ± 0.002	0.0145 ± 0.002
11/18/02	0.0168 ± 0.002	0.0165 ± 0.002	0.0160 ± 0.001	0.0126 ± 0.001	0.0201 ± 0.002	0.0145 ± 0.002
11/25/02	0.0120 ± 0.001	0.0103 ± 0.001	0.0110 ± 0.001	0.0146 ± 0.001	0.0127 ± 0.001	0.0123 ± 0.001
12/02/02	0.0166 ± 0.002	0.0205 ± 0.002	0.0164 ± 0.001	0.0170 ± 0.002	0.0195 ± 0.002	0.0168 ± 0.002
12/09/02	0.0158 ± 0.002	0.0197 ± 0.002	0.0200 ± 0.002	0.0179 ± 0.002	0.0203 ± 0.002	0.0189 ± 0.002
12/16/02	0.0147 ± 0.002	0.0088 ± 0.001	0.0100 ± 0.001	0.0135 ± 0.001	0.0104 ± 0.001	0.0140 ± 0.002
12/23/02	0.0170 ± 0.002	0.0157 ± 0.002	0.0139 ± 0.001	0.0152 ± 0.002	0.0153 ± 0.002	0.0143 ± 0.002

** Optional sample location.

TABLE 6-7

NMPNS/JAF SITE
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE STATIONS - 2002
I-131 ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	R-1* OFF-SITE	R-2* OFF-SITE	R-3* OFF-SITE	R-4* OFF-SITE	R-5* OFF-SITE	D-2** OFF-SITE	E** OFF-SITE	F** OFF-SITE	G** OFF-SITE
01/02/02	< 0.0283	< 0.0283	< 0.0315	< 0.0392	< 0.0280	< 0.0323	< 0.0343	< 0.0394	< 0.0286
01/08/02	< 0.0260	< 0.0235	< 0.0206	< 0.0340	< 0.0290	< 0.0303	< 0.0307	< 0.0182	< 0.0177
01/15/02	< 0.0340	< 0.0270	< 0.0327	< 0.0063	< 0.0181	< 0.0313	< 0.0284	< 0.0056	< 0.0259
01/22/02	< 0.0251	< 0.0262	< 0.0166	< 0.0206	< 0.0331	< 0.0275	< 0.0264	< 0.0304	< 0.0225
01/29/02	< 0.0192	< 0.0200	< 0.0335	< 0.0184	< 0.0249	< 0.0262	< 0.0274	< 0.0276	< 0.0179
02/05/02	< 0.0251	< 0.0154	< 0.0220	< 0.0143	< 0.0226	< 0.0240	< 0.0277	< 0.0225	< 0.0211
02/12/02	< 0.0165	< 0.0230	< 0.0334	< 0.0279	< 0.0307	< 0.0277	< 0.0359	< 0.0217	< 0.0311
02/19/02	< 0.0289	< 0.0291	< 0.0312	< 0.0308	< 0.0340	< 0.0209	< 0.0314	< 0.0054	< 0.0284
02/26/02	< 0.0288	< 0.0200	< 0.0218	< 0.0239	< 0.0290	< 0.0312	< 0.0240	< 0.0306	< 0.0267
03/05/02	< 0.0226	< 0.0247	< 0.0303	< 0.0259	< 0.0211	< 0.0202	< 0.0340	< 0.0270	< 0.0143
03/12/02	< 0.0273	< 0.0246	< 0.0312	< 0.0060	< 0.0205	< 0.0319	< 0.0228	< 0.0187	< 0.0248
03/19/02	< 0.0227	< 0.0264	< 0.0338	< 0.0079	< 0.0281	< 0.0246	< 0.0297	< 0.0249	< 0.0189
03/26/02	< 0.0334	< 0.0232	< 0.0271	< 0.0236	< 0.0368	< 0.0304	< 0.0234	< 0.0307	< 0.0135
04/02/02	< 0.0437	< 0.0276	< 0.0325	< 0.0326	< 0.0229	< 0.0328	< 0.0372	< 0.0195	< 0.0298
04/09/02	< 0.0091	< 0.0199	< 0.0362	< 0.0286	< 0.0349	< 0.0371	< 0.0304	< 0.0258	< 0.0058
04/16/02	< 0.0274	< 0.0238	< 0.0210	< 0.0241	< 0.0392	< 0.0358	< 0.0299	< 0.0276	< 0.0287
04/23/02	< 0.0543	< 0.0245	< 0.0297	< 0.0250	< 0.0342	< 0.0275	< 0.0352	< 0.0358	< 0.0325
04/30/02	< 0.0289	< 0.0262	< 0.0317	< 0.0305	< 0.0419	< 0.0214	< 0.0349	< 0.0174	< 0.0200
05/07/02	< 0.0337	< 0.0147	< 0.0097	< 0.0335	< 0.0293	< 0.0331	< 0.0212	< 0.0197	< 0.0284
05/14/02	< 0.0290	< 0.0236	< 0.0278	< 0.0302	< 0.0236	< 0.0342	< 0.0306	< 0.0286	< 0.0224
05/21/02	< 0.0202	< 0.0163	< 0.0226	< 0.0222	< 0.0220	< 0.0201	< 0.0301	< 0.0272	< 0.0267
05/28/02	< 0.0210	< 0.0233	< 0.0232	< 0.0276	< 0.0260	< 0.0323	< 0.0195	< 0.0375	< 0.0325
06/04/02	< 0.0267	< 0.0298	< 0.0226	< 0.0068	< 0.0329	< 0.0320	< 0.0217	< 0.0175	< 0.0389
06/11/02	< 0.0324	< 0.0256	< 0.0213	< 0.0353	< 0.0238	< 0.0252	< 0.0247	< 0.0286	< 0.0220
06/18/02	< 0.0261	< 0.0262	< 0.0256	< 0.0265	< 0.0240	< 0.0331	< 0.0318	< 0.0283	< 0.0169
06/25/02	< 0.0258	< 0.0256	< 0.0230	< 0.0278	< 0.0233	< 0.0254	< 0.0296	< 0.0358	< 0.0257

* Sample location required by TS/ODCM.
** Optional sample location.

TABLE 6-7 (continued)

NMPNS/JAF SITE

ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE STATIONS - 2002

I-131 ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	R-1* OFF-SITE	R-2* OFF-SITE	R-3* OFF-SITE	R-4* OFF-SITE	R-5* OFF-SITE	D-2** OFF-SITE	E** OFF-SITE	F** OFF-SITE	G** OFF-SITE
07/02/02	< 0.0255	< 0.0307	< 0.0237	< 0.0335	< 0.0347	< 0.0060	< 0.0304	< 0.0342	< 0.0315
07/09/02	< 0.0211	< 0.0265	< 0.0270	< 0.0211	< 0.0389	< 0.0331	< 0.0203	< 0.0166	< 0.0243
07/16/02	< 0.0405	< 0.0251	< 0.0295	< 0.0275	< 0.0261	< 0.0361	< 0.0154	< 0.0303	< 0.0167
07/23/02	< 0.0083	< 0.0223	< 0.0312	< 0.0341	< 0.0242	< 0.0244	< 0.0425	< 0.0239	< 0.0235
07/30/02	< 0.0261	< 0.0194	< 0.0293	< 0.0292	< 0.0271	< 0.0296	< 0.0235	< 0.0150	< 0.0284
08/06/02	< 0.0399	< 0.0268	< 0.0150	< 0.0261	< 0.0259	< 0.0282	< 0.0238	< 0.0151	< 0.0248
08/13/02	< 0.0388	< 0.0312	< 0.0194	< 0.0174	< 0.0081	< 0.0228	< 0.0192	< 0.0236	< 0.0213
08/20/02	< 0.0378	< 0.0338	< 0.0270	< 0.0215	< 0.0350	< 0.0082	< 0.0184	< 0.0193	< 0.0239
08/27/02	< 0.0342	< 0.0296	< 0.0253	< 0.0284	< 0.0327	< 0.0315	< 0.0157	< 0.0231	< 0.0245
09/03/02	< 0.0338	< 0.0339	< 0.0280	< 0.0230	< 0.0216	< 0.0372	< 0.0221	< 0.0283	< 0.0256
09/10/02	< 0.0279	< 0.0390	< 0.0301	< 0.0283	< 0.0357	< 0.0261	< 0.0244	< 0.0373	< 0.0335
09/17/02	< 0.0238	< 0.0251	< 0.0158	< 0.0295	< 0.0305	< 0.0278	< 0.0156	< 0.0296	< 0.0290
09/24/02	< 0.0238	< 0.0369	< 0.0513	< 0.0231	< 0.0207	< 0.0316	< 0.0084	< 0.0226	< 0.0224
10/01/02	< 0.0254	< 0.0303	< 0.0233	< 0.0323	< 0.0257	< 0.0279	< 0.0246	< 0.0194	< 0.0164
10/08/02	< 0.0162	< 0.0153	< 0.0203	< 0.0198	< 0.0222	< 0.0272	< 0.0221	< 0.0126	< 0.0191
10/15/02	< 0.0238	< 0.0191	< 0.0171	< 0.0248	< 0.0207	< 0.0278	< 0.0176	< 0.0222	< 0.0195
10/22/02	< 0.0253	< 0.0155	< 0.0203	< 0.0233	< 0.0257	< 0.0180	<0.0108	< 0.0206	< 0.0204
10/29/02	< 0.0133	< 0.0165	< 0.0128	< 0.0191	< 0.0274	< 0.0161	< 0.0127	< 0.0191	< 0.0208
11/05/02	< 0.0199	< 0.0244	< 0.0243	< 0.0238	< 0.0154	< 0.0149	< 0.0163	< 0.0205	< 0.0172
11/12/02	< 0.0219	< 0.0126	< 0.0191	< 0.0235	< 0.0168	< 0.0189	< 0.0195	< 0.0261	< 0.0223
11/19/02	< 0.0133	< 0.0160	< 0.0221	< 0.0191	< 0.0251	< 0.0205	< 0.0141	< 0.0135	< 0.0224
11/26/02	< 0.0166	< 0.0179	< 0.0209	< 0.0239	< 0.0140	< 0.0210	< 0.0177	< 0.0234	< 0.0234
12/03/02	< 0.0140	< 0.0226	< 0.0143	< 0.0246	< 0.0171	< 0.0300	< 0.0161	< 0.0178	< 0.0169
12/10/02	< 0.0177	< 0.0248	< 0.0214	< 0.0161	< 0.0176	< 0.0309	< 0.0138	< 0.0140	< 0.0150
12/17/02	< 0.0233	< 0.0254	< 0.0233	< 0.0229	< 0.0263	< 0.0248	< 0.0298	<0.0244	< 0.0177
12/23/02	< 0.0166	< 0.0188	< 0.0183	< 0.0196	< 0.0205	< 0.0184	< 0.0216	< 0.0162	< 0.0127

* Sample location required by TS/ODCM.

** Optional sample location.

TABLE 6-8

NMPNS/JAF SITE
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE STATIONS - 2002

I-131 ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	D1** ON-SITE	G** ON-SITE	H** ON-SITE	I** ON-SITE	J** ON-SITE	K** ON-SITE
12/31/01	< 0.0279	< 0.0270	< 0.0270	< 0.0352	< 0.0303	< 0.0320
01/07/02	< 0.0314	< 0.0239	< 0.0231	< 0.0237	< 0.0193	< 0.0163
01/14/02	< 0.0264	< 0.0298	< 0.0270	< 0.0240	< 0.0257	< 0.0276
01/21/02	< 0.0299	< 0.0219	< 0.0288	< 0.0319	< 0.0279	< 0.0303
01/28/02	< 0.0323	< 0.0262	< 0.0300	< 0.0257	< 0.0173	< 0.0272
02/04/02	< 0.0294	< 0.0237	< 0.0456	< 0.0370	< 0.0429	< 0.0160
02/11/02	< 0.0318	< 0.0143	< 0.0205	< 0.0290	< 0.0286	< 0.0265
02/19/02	< 0.0094	< 0.0234	< 0.0282	< 0.0352	< 0.0329	< 0.0309
02/25/02	< 0.0317	< 0.0227	< 0.0307	< 0.0225	< 0.0259	< 0.0242
03/04/02	< 0.0356	< 0.0198	< 0.0301	< 0.0290	< 0.0338	< 0.0242
03/11/02	< 0.0355	< 0.0274	< 0.0170	< 0.0241	< 0.0199	< 0.0242
03/18/02	< 0.0320	< 0.0230	< 0.0277	< 0.0056	< 0.0314	< 0.0244
03/25/02	< 0.0377	< 0.0303	< 0.0218	< 0.0254	< 0.0224	< 0.0360
04/01/02	< 0.0066	< 0.0215	< 0.0339	< 0.0289	< 0.0246	< 0.0268
04/08/02	< 0.0366	< 0.0249	< 0.0419	< 0.0336	< 0.0285	< 0.0201
04/15/02	< 0.0304	< 0.0285	< 0.0327	< 0.0293	< 0.0238	< 0.0381
04/22/02	< 0.0084	< 0.0229	< 0.0417	< 0.0210	< 0.0356	< 0.0217
04/29/02	< 0.0316	< 0.0331	< 0.0343	< 0.0184	< 0.0165	< 0.0206
05/06/02	< 0.0228	< 0.0136	< 0.0359	< 0.0295	< 0.0327	< 0.0246
05/13/02	< 0.0255	< 0.0282	< 0.0371	< 0.0297	< 0.0279	< 0.0273
05/20/02	< 0.0344	< 0.0167	< 0.0211	< 0.0287	< 0.0150	< 0.0203
05/28/02	< 0.0203	< 0.0343	< 0.0216	< 0.0358	< 0.0115	< 0.0278
06/03/02	< 0.0325	< 0.0204	< 0.0274	< 0.0234	< 0.0208	< 0.0376
06/10/02	< 0.0400	< 0.0296	< 0.0227	< 0.0254	< 0.0240	< 0.0271
06/17/02	< 0.0184	< 0.0313	< 0.0230	< 0.0289	< 0.0290	< 0.0200
06/24/02	< 0.0168	< 0.0247	< 0.0293	< 0.0300	< 0.0195	< 0.0348

** Optional sample location.

TABLE 6-8 (continued)

NMPNS/JAF SITE
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE STATIONS - 2002
I-131 ACTIVITY $pCi/m^3 \pm 1$ SIGMA

LOCATION

Week Start Date	D1** ON-SITE	G** ON-SITE	H** ON-SITE	I** ON-SITE	J** ON-SITE	K** ON-SITE
07/01/02	< 0.0265	< 0.0270	< 0.0199	< 0.0343	< 0.0318	< 0.0194
07/08/02	< 0.0286	< 0.0167	< 0.0157	< 0.0260	< 0.0271	< 0.0217
07/15/02	< 0.0212	< 0.0209	< 0.0226	< 0.0263	< 0.0289	< 0.0246
07/22/02	< 0.0232	< 0.0383	< 0.0060	< 0.0222	< 0.0351	< 0.0349
07/29/02	< 0.0334	< 0.0247	< 0.0259	< 0.0159	< 0.0283	< 0.0059
08/05/02	< 0.0288	< 0.0254	< 0.0268	< 0.0264	< 0.0234	< 0.0280
08/12/02	< 0.0294	< 0.0300	< 0.0219	< 0.0213	< 0.0209	< 0.0262
08/19/02	< 0.0313	< 0.0276	< 0.0302	< 0.0286	< 0.0240	< 0.0264
08/26/02	< 0.0266	< 0.0287	< 0.0272	< 0.0253	< 0.0352	< 0.0267
09/03/02	< 0.0448	< 0.0271	< 0.0237	< 0.0374	< 0.0094	< 0.0378
09/09/02	< 0.0284	< 0.0270	< 0.0266	< 0.0323	< 0.0270	< 0.0206
09/16/02	< 0.0307	< 0.0211	< 0.0247	< 0.0261	< 0.0170	< 0.0293
09/23/02	< 0.0328	< 0.0232	< 0.0304	< 0.0348	< 0.0194	< 0.0325
09/30/02	< 0.0285	< 0.0219	< 0.0308	< 0.0146	< 0.0343	< 0.0254
10/07/02	< 0.0264	< 0.0208	< 0.0207	< 0.0142	< 0.0168	< 0.0186
10/14/02	< 0.0249	< 0.0187	< 0.0240	< 0.0122	< 0.0161	< 0.0197
10/21/02	< 0.0172	< 0.0176	< 0.0184	< 0.0181	< 0.0183	< 0.0228
10/28/02	< 0.0263	< 0.0205	< 0.0135	< 0.0227	< 0.0246	< 0.0236
11/04/02	< 0.0165	< 0.0143	< 0.0174	< 0.0161	< 0.0161	< 0.0252
11/12/02	< 0.0282	< 0.0153	< 0.0214	< 0.0262	< 0.0173	< 0.0292
11/18/02	< 0.0221	< 0.0206	< 0.0160	< 0.0205	< 0.0181	< 0.0210
11/25/02	< 0.0226	< 0.0122	< 0.0193	< 0.0238	< 0.0173	< 0.0152
12/02/02	< 0.0213	< 0.0122	< 0.0161	< 0.0120	< 0.0202	< 0.0178
12/09/02	< 0.0310	< 0.0184	< 0.0183	< 0.0185	< 0.0252	< 0.0149
12/16/02	< 0.0199	< 0.0243	< 0.0174	< 0.0211	< 0.0220	< 0.0227
12/23/02	< 0.0203	< 0.0169	< 0.0158	< 0.0245	< 0.0192	< 0.0243

** Optional sample location.

TABLE 6-9

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

R1 OFF-SITE COMPOSITE*

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	94.9 ± 21.9	129 ± 22.7	57.7 ± 14.1	99.6 ± 20.1	94.2 ± 18.5	130 ± 25.7
Zn-65	<13.8	<10.7	<4.14	<13.8	<9.75	<16.4
Cs-134	<5.49	<0.95	<2.90	<6.14	<3.33	<4.98
Cs-137	<4.38	<3.90	<2.41	<3.74	<3.45	<3.47
Zr-95	<9.45	<6.61	<6.23	<9.82	<6.32	<9.84
Nb-95	<6.67	<6.16	<5.62	<4.30	<3.84	<7.40
Co-58	<8.08	<5.57	<3.62	<6.42	<1.01	<4.43
Mn-54	<4.60	<4.62	<2.41	<6.17	<4.24	<4.39
Co-60	<1.76	<5.53	<4.59	<5.59	<4.37	<6.07
K-40	86.3 ± 31.4	<58.7	<12.9	<63.2	<46.5	<17.2
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	**JULY**	**AUGUST**	**SEPTEMBER**	**OCTOBER**	**NOVEMBER**	**DECEMBER**
Be-7	91.5 ± 20.2	114 ± 17.4	118 ± 13.6	40.7 ± 12.8	61.7 ± 10.2	52.1 ± 11.3
Zn-65	<2.99	<10.5	<6.51	<8.06	<3.75	<5.14
Cs-134	<0.96	<3.43	<2.45	<2.59	<1.58	<2.40
Cs-137	<4.85	<3.79	<1.46	<1.64	<1.79	<2.12
Zr-95	<8.18	<7.89	<4.28	<5.37	<4.97	<5.46
Nb-95	<6.44	<3.32	<3.57	<4.20	<3.01	<3.48
Co-58	<4.23	<2.77	<2.14	<4.68	<2.89	<2.79
Mn-54	<4.66	<2.98	<2.15	<2.27	<1.18	<2.22
Co-60	<6.49	<3.52	<0.77	<0.83	<3.19	<3.46
K-40	<59.8	<12.5	<7.82	<28.8	<17.9	<8.33
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

* Sample location required by TS/ODCM.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

R2 OFF-SITE COMPOSITE*

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	78.0 ± 18.5	112 ± 19.1	66.5 ± 16.1	98.7 ± 22.1	92.4 ± 15.2	101 ± 20.0
Zn-65	<15.1	<9.15	<16.6	<3.67	<5.87	<7.37
Cs-134	<2.53	<4.44	<3.77	<4.52	<2.97	<5.29
Cs-137	<3.61	<3.50	<2.62	<4.92	<3.21	<3.54
Zr-95	<7.86	<7.74	<7.53	<7.15	<6.04	<5.95
Nb-95	<3.83	<3.81	<5.22	<4.84	<4.12	<4.75
Co-58	<4.56	<4.49	<4.78	<4.44	<2.43	<5.23
Mn-54	<3.83	<4.41	<4.06	<6.40	<2.77	<4.47
Co-60	<4.44	<5.47	<4.59	<2.14	<1.24	<3.46
K-40	<15.9	<61.1	65.1 ± 21.1	<62.6	<12.6	119 ± 23.7
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	102 ± 17.3	45.9 ± 15.6	117 ± 16.4	72.8 ± 12.5	70.1 ± 12.5	61.3 ± 10.8
Zn-65	<7.20	<10.9	<7.95	<5.04	<8.67	<6.91
Cs-134	<4.45	<3.39	<2.98	<2.81	<2.47	<3.37
Cs-137	<3.02	<0.96	<3.00	<2.54	<2.61	<2.01
Zr-95	<7.44	<10.0	<5.50	<5.56	<1.32	<7.05
Nb-95	<5.71	<5.99	<3.75	<2.64	<3.36	<4.99
Co-58	<4.82	<3.96	<2.63	<2.47	<4.62	<3.22
Mn-54	<3.93	<4.27	<2.77	<3.03	<2.40	<2.55
Co-60	<1.52	<7.72	<4.08	<3.01	<1.03	<3.84
K-40	<61.5	<53.4	98.8 ± 21.2	<29.0	<10.6	61.5 ± 13.7
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

* Sample location required by TS/ODCM.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

R3 OFF-SITE COMPOSITE*

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	77.9 ± 17.1	96.9 ± 19.0	52.9 ± 16.4	138 ± 21.1	116 ± 17.0	105 ± 18.8
Zn-65	<7.62	<13.5	<16.6	<8.10	<5.53	<9.34
Cs-134	<4.05	<4.03	<3.96	<2.50	<0.67	<2.86
Cs-137	<4.87	<2.37	<2.63	<4.24	<2.56	<4.19
Zr-95	<7.92	<9.28	<6.46	<8.91	<7.95	<8.24
Nb-95	<6.50	<5.70	<4.49	<5.92	<4.44	<1.33
Co-58	<6.53	<3.64	<5.91	<3.97	<3.78	<4.23
Mn-54	<5.01	<3.02	<3.40	<2.75	<0.76	<3.14
Co-60	<7.47	<4.50	<7.88	<5.37	<1.16	<4.86
K-40	<58.2	<45.6	<54.5	<45.3	<33.6	<15.1
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	**JULY**	**AUGUST**	**SEPTEMBER**	**OCTOBER**	**NOVEMBER**	**DECEMBER**
Be-7	131 ± 19.1	95.8 ± 17.0	96.4 ± 12.7	67.2 ± 11.8	67.1 ± 9.96	60.7 ± 11.7
Zn-65	<6.61	<8.69	<5.82	<4.64	<4.89	<8.19
Cs-134	<3.85	<3.47	<3.85	<2.94	<1.95	<3.96
Cs-137	<3.41	<2.73	<2.00	<2.60	<2.16	<3.21
Zr-95	<8.74	<4.51	<6.09	<3.86	<4.19	<6.28
Nb-95	<4.63	<4.08	<4.15	<3.92	<3.53	<4.05
Co-58	<3.07	<3.42	<2.72	<2.91	<2.51	<3.31
Mn-54	<0.91	<2.89	<3.24	<2.84	<1.82	<2.67
Co-60	<1.39	<4.48	<3.68	<3.21	<2.81	<4.11
K-40	<50.9	<12.0	102 ± 16.5	49.3 ± 14.0	<18.4	108 ± 18.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

* Sample location required by TS/ODCM.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

R4 OFF-SITE COMPOSITE*

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	79.7 ± 21.3	146 ± 25.7	109 ± 17.4	116 ± 20.1	95.3 ± 17.8	152 ± 22.1
Zn-65	<8.30	<15.1	<12.8	<7.49	<9.41	<7.46
Cs-134	<4.48	<3.49	<3.29	<5.33	<2.88	<4.60
Cs-137	<3.96	<4.08	<2.26	<4.11	<2.78	<3.64
Zr-95	<10.4	<8.93	<7.54	<5.25	<6.06	<7.71
Nb-95	<7.33	<7.12	<4.86	<3.55	<1.21	<7.37
Co-58	<6.58	<5.18	<3.71	<4.95	<4.09	<5.45
Mn-54	<3.91	<4.30	<3.94	<3.53	<4.29	<3.51
Co-60	<4.91	<16.4	<4.12	<4.52	<3.83	<5.68
K-40	<63.2	113 ± 31.9	<28.2	<44.0	<49.5	<16.0
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	110 ± 22.0	89.1 ± 15.9	85.4 ± 14.8	54.2 ± 12.8	73.0 ± 10.8	75.0 ± 13.6
Zn-65	<11.0	<8.61	<10.8	<8.77	<5.31	<7.43
Cs-134	<4.09	<2.96	<4.06	<3.74	<2.55	<2.84
Cs-137	<4.24	<3.20	<2.68	<2.82	<1.36	<2.35
Zr-95	<9.23	<5.32	<7.67	<7.18	<4.70	<6.58
Nb-95	<6.36	<6.26	<4.68	<4.56	<2.62	<4.40
Co-58	<5.37	<2.47	<2.72	<3.70	<2.57	<4.12
Mn-54	<6.38	<2.77	<3.88	<2.02	<1.77	<2.69
Co-60	<6.61	<3.52	<3.67	<4.56	<1.95	<2.37
K-40	<57.9	<34.2	<55.4	89.2 ± 19.1	<18.9	<9.24
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

* Sample location required by TS/ODCM.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

R5 OFF-SITE COMPOSITE (CONTROL)*

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	104 ± 19.6	106 ± 25.6	109 ± 16.9	119 ± 21.4	100 ± 16.4	108 ± 19.6
Zn-65	<10.5	<3.91	<11.6	<9.45	<8.35	<10.5
Cs-134	<3.40	<4.11	<3.71	<4.02	<4.71	<3.84
Cs-137	<4.67	<3.15	<0.74	<5.86	<3.46	<2.87
Zr-95	<10.1	<2.94	<7.66	<5.89	<4.78	<5.76
Nb-95	<1.56	<7.21	<5.69	<1.38	<4.95	<5.04
Co-58	<4.83	<7.29	<2.71	<5.07	<3.58	<3.35
Mn-54	<4.05	<6.06	<3.34	<1.04	<4.46	<4.73
Co-60	<1.65	<6.40	<1.36	<1.58	<2.79	<4.30
K-40	<57.6	<83.0	<55.2	101 ± 24.5	71.9 ± 19.4	<43.7
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	122 ± 22.2	94.3 ± 16.2	110 ± 13.2	65.3 ± 12.6	81.6 ± 11.2	70.8 ± 12.0
Zn-65	<10.9	<8.09	<6.22	<6.58	<5.15	<7.12
Cs-134	<4.13	<2.94	<3.33	<3.53	<2.33	<2.47
Cs-137	<3.00	<2.54	<2.60	<2.45	<1.90	<2.19
Zr-95	<7.12	<4.47	<5.23	<6.33	<3.24	<6.30
Nb-95	<4.90	<5.13	<2.82	<4.34	<2.61	<3.88
Co-58	<4.50	<3.30	<3.34	<3.51	<1.48	<3.67
Mn-54	<4.14	<2.20	<2.71	<2.90	<2.44	<2.44
Co-60	<5.70	<3.29	<3.92	<2.64	<3.10	<0.85
K-40	75.7 ± 22.2	<11.7	<34.4	109 ± 18.6	42.0 ± 10.2	<8.59
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

* Sample location required by TS/ODCM.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

D2-OFF-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	122 ± 19.9	179 ± 23.3	84.1 ± 18.4	136 ± 22.3	92.3 ± 17.4	124 ± 23.9
Zn-65	<2.81	<13.4	<22.9	<10.5	<9.74	<15.7
Cs-134	<4.78	<3.14	<4.91	<4.16	<4.44	<4.76
Cs-137	<3.51	<3.76	<4.06	<4.03	<2.95	<4.85
Zr-95	<7.95	<2.21	<7.72	<12.5	<10.4	<8.43
Nb-95	<4.42	<6.61	<6.22	<7.97	<7.10	<7.61
Co-58	<1.26	<4.82	<4.81	<5.25	<4.40	<4.91
Mn-54	<3.04	<3.46	<6.27	<3.94	<13.2	<5.12
Co-60	<1.60	<4.24	<5.05	<7.35	<2.08	<4.57
K-40	<16.2	<65.6	<18.1	159 ± 32.5	<60.5	<46.5
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	146 ± 21.3	102 ± 19.8	94.5 ± 14.3	40.5 ± 12.7	41.9 ± 11.8	75.4 ± 12.2
Zn-65	<9.18	<3.26	<1.49	<6.04	<8.46	<5.61
Cs-134	<5.15	<4.02	<3.04	<3.52	<3.34	<2.98
Cs-137	<3.55	<2.67	<2.94	<2.23	<2.33	<2.33
Zr-95	<5.18	<6.94	<5.03	<4.41	<6.14	<7.02
Nb-95	<4.48	<4.83	<4.14	<3.83	<4.27	<4.31
Co-58	<5.31	<5.15	<2.09	<4.11	<3.92	<3.20
Mn-54	<3.42	<3.44	<3.08	<1.54	<2.34	<2.76
Co-60	<1.53	<5.35	<3.09	<3.12	<4.73	<3.39
K-40	<42.4	<19.2	<29.8	<38.9	<29.3	51.5 ± 12.5
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.

† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

E OFF-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	57.4 ± 21.2	110 ± 20.4	70.2 ± 15.0	124 ± 23.5	83.3 ± 17.3	98.4 ± 23.7
Zn-65	<15.6	<15.4	<20.0	<10.6	<10.5	<11.8
Cs-134	<5.07	<5.28	<3.34	<5.22	<4.20	<6.31
Cs-137	<3.75	<4.32	<2.48	<4.06	<2.25	<3.54
Zr-95	<11.0	<7.40	<7.47	<11.3	<7.92	<7.70
Nb-95	<1.74	<5.29	<4.45	<6.28	<5.79	<4.75
Co-58	<7.47	<6.47	<2.93	<6.19	<4.07	<6.47
Mn-54	<6.26	<4.87	<3.68	<3.83	<4.25	<4.76
Co-60	<7.63	<4.76	<1.31	<3.83	<1.43	<3.46
K-40	144 ± 31.5	<46.2	<48.1	132 ± 25.9	<39.6	120 ± 26.9
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	141 ± 19.9	76.7 ± 13.1	111 ± 13.2	67.6 ± 12.6	76.7 ± 11.2	75.9 ± 12.9
Zn-65	<6.96	<7.65	<6.62	<5.00	<5.65	<5.72
Cs-134	<3.33	<1.85	<2.63	<2.29	<2.02	<3.68
Cs-137	<3.91	<3.93	<2.26	<2.37	<2.36	<3.80
Zr-95	<7.07	<1.60	<4.36	<5.93	<2.62	<5.50
Nb-95	<6.93	<3.62	<2.01	<5.65	<3.47	<4.99
Co-58	<3.24	<3.89	<3.34	<3.14	<1.37	<3.63
Mn-54	<3.52	<2.96	<3.07	<2.60	<1.87	<2.51
Co-60	<4.16	<5.11	<2.23	<2.98	<2.25	<2.98
K-40	<42.2	<59.5	<28.7	<23.8	37.4 ± 11.6	125 ± 22.3
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Options sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

F OFF-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	<40.2	154 ± 20.7	53.6 ± 18.1	117 ± 25.9	73.9 ± 15.7	96.6 ± 18.9
Zn-65	<10.2	<14.3	<11.4	<9.98	<5.98	<6.73
Cs-134	<3.11	<3.32	<3.78	<3.90	<3.98	<2.78
Cs-137	<5.21	<2.75	<3.43	<1.11	<1.98	<2.13
Zr-95	<7.96	<9.55	<9.45	<7.15	<1.64	<6.85
Nb-95	<7.04	<6.10	<4.05	<6.11	<4.20	<6.71
Co-58	<4.74	<6.51	<3.94	<6.56	<2.47	<4.63
Mn-54	<4.40	<3.52	<3.34	<4.91	<3.27	<0.93
Co-60	<4.20	<7.46	<3.63	<7.74	<4.56	<5.11
K-40	<44.4	<14.7	69.2 ± 21.9	<22.0	<34.9	56.2 ± 19.8
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	65.0 ± 18.9	109 ± 16.7	87.5 ± 15.0	61.3 ± 13.8	46.6 ± 9.84	70.6 ± 11.2
Zn-65	<14.1	<2.05	<9.49	<9.20	<4.59	<5.22
Cs-134	<4.83	<3.14	<3.00	<3.33	<2.34	<3.13
Cs-137	<2.76	<1.83	<2.10	<2.10	<1.31	<2.70
Zr-95	<9.86	<4.02	<5.31	<7.13	<4.27	<5.58
Nb-95	<3.81	<2.80	<2.98	<3.67	<2.97	<3.58
Co-58	<4.07	<2.93	<4.28	<3.73	<1.90	<2.61
Mn-54	<4.91	<2.08	<3.55	<2.47	<2.52	<2.64
Co-60	<5.57	<1.17	<3.52	<3.53	<2.38	<3.50
K-40	126 ± 29.2	<32.4	<47.1	62.6 ± 18.0	<18.2	59.2 ± 16.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

G OFF-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	67.8 ± 15.8	120 ± 20.6	75.4 ± 14.6	91.3 ± 18.6	88.3 ± 16.1	103 ± 20.6
Zn-65	<9.45	<12.8	<9.56	<10.5	<6.71	<2.71
Cs-134	<4.76	<2.05	<3.30	<3.91	<3.76	<4.83
Cs-137	<0.74	<2.86	<2.88	<3.33	<2.46	<4.89
Zr-95	<7.85	<9.26	<8.73	<6.72	<6.26	<10.6
Nb-95	<5.58	<6.61	<4.82	<5.66	<2.89	<4.82
Co-58	<3.91	<3.80	<3.21	<2.78	<2.46	<3.22
Mn-54	<3.26	<4.79	<3.96	<2.42	<2.69	<4.91
Co-60	<3.83	<6.50	<3.98	<4.71	<4.70	<5.57
K-40	<49.1	87.4 ± 23.3	90.1 ± 19.3	<50.2	<32.3	120 ± 28.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	133 ± 21.1	95.2 ± 16.3	109 ± 14.1	52.4 ± 11.6	68.0 ± 10.7	62.6 ± 12.5
Zn-65	<9.55	<8.09	<7.45	<5.68	<6.31	<6.42
Cs-134	<3.66	<0.66	<4.18	<4.31	<2.06	<3.51
Cs-137	<3.51	<2.84	<2.90	<2.66	<1.98	<1.65
Zr-95	<10.3	<8.08	<5.33	<6.60	<4.51	<4.03
Nb-95	<5.34	<4.59	<3.64	<3.41	<0.60	<3.07
Co-58	<4.11	<3.30	<3.49	<3.10	<2.82	<2.62
Mn-54	<3.51	<2.20	<1.92	<2.28	<1.82	<3.33
Co-60	<1.17	<4.86	<0.64	<2.21	<2.72	<3.01
K-40	117 ± 23.9	<42.4	106 ± 18.5	86.3 ± 14.4	53.3 ± 11.4	<8.46
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

D1 ON-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	60.7 ± 14.4	108 ± 24.2	84.5 ± 16.9	123 ± 24.1	116 ± 22.3	118 ± 20.4
Zn-65	<14.1	<8.18	<16.4	<16.0	<3.52	<2.68
Cs-134	<5.13	<5.30	<3.34	<5.75	<4.85	<3.89
Cs-137	<4.39	<5.10	<2.57	<3.62	<5.15	<3.75
Zr-95	<8.96	<10.4	<8.06	<9.01	<7.02	<9.71
Nb-95	<6.40	<6.72	<7.31	<7.43	<4.84	<6.75
Co-58	<5.18	<3.70	<5.02	<4.53	<6.42	<3.41
Mn-54	<3.70	<4.97	<1.16	<3.12	<4.72	<4.28
Co-60	<4.34	<1.70	<1.83	<1.77	<5.79	<1.53
K-40	<44.0	126 ± 30.3	<53.4	<74.9	<59.2	91.6 ± 22.9
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	99.1 ± 24.9	110 ± 21.2	123 ± 19.3	82.9 ± 13.9	47.9 ± 12.8	67.4 ± 13.1
Zn-65	<24.0	<12.0	<7.12	<6.23	<7.04	<9.62
Cs-134	<5.37	<4.16	<4.03	<2.63	<2.44	<2.32
Cs-137	<6.12	<4.04	<4.26	<2.17	<2.36	<3.65
Zr-95	<10.5	<9.54	<7.28	<6.01	<4.82	<5.76
Nb-95	<5.75	<7.45	<6.47	<4.80	<5.18	<4.58
Co-58	<6.13	<4.79	<4.25	<3.05	<3.66	<4.39
Mn-54	<1.43	<4.72	<4.74	<2.70	<2.37	<3.39
Co-60	<2.25	<6.30	<5.44	<2.19	<1.02	<3.58
K-40	<23.0	<50.7	<15.3	<29.3	<5.34	<36.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

G ON-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	59.5 ± 16.3	144 ± 25.5	91.7 ± 15.2	105 ± 20.7	88.7 ± 16.8	136 ± 23.3
Zn-65	<12.1	<3.69	<11.4	<8.36	<7.96	<12.8
Cs-134	<4.80	<4.48	<0.68	<6.07	<2.82	<4.84
Cs-137	<3.83	<3.75	<2.41	<3.33	<1.98	<5.63
Zr-95	<8.38	<7.60	<5.27	<9.94	<4.76	<10.5
Nb-95	<6.68	<8.02	<4.75	<6.36	<2.95	<7.88
Co-58	<4.19	<5.95	<3.54	<5.12	<3.61	<5.03
Mn-54	<4.50	<4.92	<2.16	<2.90	<2.67	<4.28
Co-60	<1.54	<2.12	<5.10	<4.97	<3.29	<4.65
K-40	<15.7	<61.6	<42.3	109 ± 24.5	<34.9	<69.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	111 ± 21.4	104 ± 16.7	142 ± 24.3	63.4 ± 12.8	73.5 ± 10.8	60.7 ± 11.4
Zn-65	<10.2	<6.24	<14.5	<6.67	<6.48	<5.91
Cs-134	<3.63	<3.67	<5.86	<2.82	<1.96	<2.93
Cs-137	<4.59	<2.49	<5.70	<2.92	<1.89	<1.87
Zr-95	<2.14	<1.66	<8.83	<5.89	<5.01	<6.61
Nb-95	<4.83	<3.77	<9.95	<4.90	<3.61	<3.93
Co-58	<3.22	<3.14	<7.64	<2.69	<2.54	<2.55
Mn-54	<3.97	<2.12	<1.55	<3.25	<1.83	<2.57
Co-60	<5.32	<3.27	<7.00	<2.95	<1.75	<2.11
K-40	<44.8	<43.6	<71.6	<40.5	<32.9	65.9 ± 15.1
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

H ON-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	86.0 ± 16.9	107 ± 23.4	111 ± 21.0	94.9 ± 22.9	103 ± 16.1	126 ± 19.4
Zn-65	<7.23	<13.7	<15.6	<15.4	<7.80	<11.5
Cs-134	<3.83	<3.21	<3.54	<5.36	<4.37	<5.68
Cs-137	<2.26	<3.29	<3.90	<3.24	<2.04	<3.56
Zr-95	<7.59	<6.56	<10.2	<11.3	<6.40	<6.83
Nb-95	<4.27	<6.86	<6.24	<5.44	<5.35	<5.56
Co-58	<3.46	<4.29	<3.66	<6.06	<3.22	<5.22
Mn-54	<3.65	<4.55	<3.09	<6.18	<3.37	<3.93
Co-60	<4.28	<6.28	<6.39	<7.60	<3.71	<5.41
K-40	<15.2	<45.7	<39.4	<18.6	<52.6	91.6 ± 25.3
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	133 ± 19.9	114 ± 16.1	81.3 ± 17.6	84.0 ± 13.8	56.0 ± 9.53	63.6 ± 11.6
Zn-65	<8.32	<7.65	<12.4	<6.16	<4.48	<5.75
Cs-134	<3.71	<3.22	<2.92	<3.12	<2.03	<3.15
Cs-137	<3.92	<1.72	<3.02	<2.48	<1.95	<2.42
Zr-95	<5.94	<4.74	<7.14	<5.04	<4.95	<4.02
Nb-95	<1.27	<5.30	<4.99	<4.25	<2.25	<3.00
Co-58	<4.44	<0.85	<3.70	<1.81	<2.27	<2.56
Mn-54	<2.46	<0.72	<3.20	<2.29	<2.33	<2.69
Co-60	<3.95	<1.10	<3.96	<4.85	<2.70	<3.13
K-40	<3.83	<38.3	<15.4	<43.1	<6.52	<20.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

I ON-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	78.3 ± 17.7	84.8 ± 18.5	80.3 ± 15.6	67.4 ± 18.7	107 ± 16.5	103 ± 20.6
Zn-65	<17.2	<9.06	<11.1	<12.6	<7.20	<13.4
Cs-134	<3.75	<5.51	<3.53	<4.88	<3.58	<4.47
Cs-137	<2.24	<0.82	<2.59	<3.88	<3.45	<3.26
Zr-95	<11.3	<8.84	<6.79	<10.6	<5.81	<7.90
Nb-95	<7.50	<7.12	<4.09	<7.84	<5.21	<5.64
Co-58	<5.00	<5.11	<3.39	<5.22	<3.38	<4.08
Mn-54	<4.63	<5.15	<3.32	<4.20	<3.35	<3.47
Co-60	<7.38	<1.49	<1.18	<5.07	<3.41	<4.28
K-40	<45.4	<54.5	<34.1	<62.6	<12.2	<57.1
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	136 ± 20.8	58.7 ± 15.8	108 ± 18.3	66.3 ± 13.1	59.9 ± 10.4	71.2 ± 10.5
Zn-65	<8.96	<6.82	<9.16	<7.55	<1.11	<5.84
Cs-134	<3.79	<2.88	<2.49	<2.75	<1.75	<2.78
Cs-137	<4.28	<2.48	<2.41	<2.35	<1.93	<2.17
Zr-95	<10.3	<5.57	<7.42	<4.19	<5.09	<5.53
Nb-95	<7.74	<3.88	<5.06	<4.04	<3.11	<4.03
Co-58	<3.32	<3.23	<3.75	<2.16	<2.57	<2.45
Mn-54	<5.10	<2.73	<3.42	<2.49	<1.77	<2.36
Co-60	<1.49	<5.30	<4.37	<3.83	<2.28	<3.16
K-40	<15.1	<32.6	<42.5	<33.6	<32.8	<21.8
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

J ON-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	59.5 ± 16.3	144 ± 23.3	56.5 ± 14.6	136 ± 23.5	101 ± 17.9	123 ± 22.2
Zn-65	<9.85	<15.1	<11.1	<12.9	<9.54	<10.1
Cs-134	<4.15	<4.22	<3.52	<5.67	<4.04	<4.49
Cs-137	<4.37	<2.89	<3.34	<4.46	<3.41	<3.34
Zr-95	<6.85	<10.0	<6.31	<10.4	<1.80	<9.25
Nb-95	<5.66	<9.02	<1.21	<4.97	<5.52	<6.43
Co-58	<5.57	<5.20	<4.19	<5.54	<4.66	<5.38
Mn-54	<3.30	<3.70	<3.17	<4.82	<0.90	<3.75
Co-60	<1.55	<6.81	<1.29	<5.98	<3.88	<6.06
K-40	<54.1	<59.4	<35.6	<48.0	<71.0	<17.1
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	99.0 ± 19.8	97.7 ± 19.3	113 ± 14.7	76.0 ± 12.9	46.1 ± 11.3	59.8 ± 12.3
Zn-65	<13.4	<3.05	<1.52	<5.68	<6.86	<8.13
Cs-134	<4.67	<4.58	<2.88	<3.42	<2.37	<3.69
Cs-137	<4.51	<2.49	<2.47	<2.09	<2.06	<2.89
Zr-95	<8.35	<9.63	<4.14	<5.44	<6.11	<5.98
Nb-95	<8.09	<7.52	<2.91	<3.65	<3.29	<4.09
Co-58	<4.85	<3.80	<3.23	<3.15	<3.57	<3.72
Mn-54	<4.13	<3.22	<2.37	<2.77	<2.31	<3.21
Co-60	<5.68	<6.35	<2.86	<2.92	<4.66	<4.07
K-40	103 ± 30.2	<17.9	69.5 ± 19.1	<32.6	<36.6	96.5 ± 18.4
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-9 (continued)

CONCENTRATIONS OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2002

Results in Units of 10^{-3} pCi/m^3 ± 1 Sigma

K ON-SITE COMPOSITE**

NUCLIDES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Be-7	62.6 ± 16.7	117 ± 23.8	69.6 ± 15.8	87.7 ± 18.8	90.5 ± 15.1	156 ± 21.2
Zn-65	<12.7	<18.1	<13.2	<11.6	<10.5	<7.45
Cs-134	<5.18	<3.92	<4.98	<6.55	<3.92	<4.97
Cs-137	<4.68	<3.01	<3.37	<3.21	<3.59	<4.50
Zr-95	<8.77	<2.84	<9.56	<7.91	<5.54	<8.88
Nb-95	<5.63	<7.02	<5.76	<6.71	<5.32	<6.90
Co-58	<3.15	<4.76	<4.76	<3.53	<4.96	<3.49
Mn-54	<4.22	<3.93	<3.75	<3.56	<3.05	<4.90
Co-60	<5.56	<6.12	<4.17	<5.25	<3.49	<1.56
K-40	<53.5	<79.3	94.6 ± 23.9	165 ± 27.9	93.3 ± 20.1	<66.6
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NUCLIDES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Be-7	138 ± 20.1	64.2 ± 15.1	130 ± 14.6	56.1 ± 12.5	55.0 ± 10.4	53.1 ± 14.8
Zn-65	<10.5	<8.82	<7.18	<3.84	<6.24	<10.6
Cs-134	<5.15	<2.32	<2.86	<2.22	<2.62	<4.19
Cs-137	<4.02	<3.65	<2.59	<1.75	<1.96	<3.45
Zr-95	<11.0	<1.60	<3.59	<6.63	<4.82	<6.76
Nb-95	<4.55	<1.11	<4.37	<4.16	<2.96	<6.86
Co-58	<2.59	<3.48	<3.54	<2.73	<2.80	<3.40
Mn-54	<3.91	<2.94	<2.46	<2.25	<1.89	<3.82
Co-60	<5.79	<3.13	<3.08	<3.34	<2.63	<3.61
K-40	102 ± 21.4	<33.1	<23.6	<29.2	<24.2	<13.0
Others†	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

** Optional sample location.
† Plant related radionuclides.

TABLE 6-10

DIRECT RADIATION MEASUREMENT RESULTS - 2002

Results in Units of mrem/std. Month ± 1 Sigma

LOCATION NUMBER	LOCATION	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	LOCATION (DISTANCE AND DIRECTION)(1)
3	D1 On-site	13.6 ± 0.5	12.3 ± 0.6	12.6 ± 0.8	9.8 ± 0.5	0.2 miles @ 69°
4	D2 On-site	5.4 ± 0.3	4.8 ± 0.2	5.0 ± 0.1	3.9 ± 0.3	0.4 miles @ 140°
5	E On-site	5.5 ± 0.3	4.7 ± 0.4	5.0 ± 0.3	3.9 ± 0.2	0.4 miles @ 175°
6	F On-site	4.2 ± 0.1	3.7 ± 0.3	4.5 ± 0.2	3.6 ± 0.2	0.5 miles @ 210°
7*	G On-site	4.8 ± 0.2	4.8 ± 0.4	3.9 ± 0.1	3.5 ± 0.2	0.7 miles @ 250°
8	R-5 Off-site Control	5.4 ± 0.3	4.2 ± 0.3	5.5 ± 0.2	4.5 ± 0.3	16.4 miles @ 42°
9	D1 Off-site	4.9 ± 0.4	3.6 ± 0.4	4.4 ± 0.3	3.7 ± 0.3	11.4 miles @ 80°
10	D2 Off-site	4.8 ± 0.2	4.4 ± 0.1	4.6 ± 0.2	3.9 ± 0.1	9.0 miles @ 117°
11	E Off-site	5.0 ± 0.2	3.9 ± 0.1	4.6 ± 0.5	3.6 ± 0.2	7.2 miles @ 160°
12	F Off-site	4.9 ± 0.3	4.1 ± 0.1	4.3 ± 0.2	3.9 ± 0.2	7.7 miles @ 190°
13	G Off-site	4.9 ± 0.3	4.3 ± 0.1	4.6 ± 0.5	3.8 ± 0.2	5.3 miles @ 225°
14*	DeMass Rd., SW Oswego –Control	5.2 ± 0.3	3.6 ± 0.3	4.7 ± 0.3	4.3 ± 0.3	12.6 miles @ 226°
15*	Pole 66, W. Boundary – Bible Camp	3.7 ± 0.2	3.7 ± 0.1	3.9 ± 0.2	3.6 ± 0.1	0.9 miles @ 237°
18*	Energy Info. Center – Lamp Post, SW	4.6 ± 0.2	4.3 ± 0.1	4.8 ± 0.2	4.2 ± 0.3	0.4 miles @ 265°
19	East Boundary-JAF, Pole 9	4.2 ± 0.3	4.2 ± 0.3	4.5 ± 0.2	4.0 ± 0.5	1.3 miles @ 81°
23*	H On-site	5.6 ± 0.6	5.4 ± 0.5	5.2 ± 0.3	4.1 ± 0.2	0.8 miles @ 70°
24	I On-site	5.4 ± 0.4	4.3 ± 0.3	4.5 ± 0.2	3.9 ± 0.3	0.8 miles @ 98°
25	J On-site	4.8 ± 0.3	3.9 ± 0.2	4.4 ± 0.1	3.8 ± 0.2	0.9 miles @ 110°
26	K On-site	5.1 ± 0.3	4.0 ± 0.2	4.5 ± 0.2	3.7 ± 0.2	0.5 miles @ 132°
27	N. Fence, N. of Switchyard, JAF	19.8 ± 1.0	18.9 ± 0.8	17.6 ± 1.5	12.4 ± 0.8	0.4 miles @ 60°
28	N. Light Pole, N. of Screenhouse, JAF	24.6 ± 1.2	24.8 ± 2.1	23.2 ± 2.2	19.1 ± 0.9	0.5 miles @ 68°
29	N. Fence, N. of W. Side	22.2 ± 1.0	21.2 ± 0.8	20.7 ± 1.0	14.9 ± 1.1	0.5 miles @ 65°
30	N. Fence, (NW) JAF	14.5 ± 0.3	12.2 ± 1.1	13.9 ± 0.8	9.6 ± 1.0	0.4 miles @ 57°
31	N. Fence, (NW) NMP-1	7.7 ± 0.3	7.0 ± 0.5	6.5 ± 0.4	6.1 ± 0.3	0.2 miles @ 276°
39	N. Fence, Rad. Waste-NMP-1	10.0 ± 0.6	9.1 ± 0.3	10.0 ± 0.5	8.4 ± 0.7	0.2 miles @ 292°
47	N. Fence, (NE) JAF	6.9 ± 0.3	6.9 ± 0.3	6.6 ± 0.4	5.2 ± 0.3	0.6 miles @ 69°
49*	Phoenix, NY-Control	4.6 ± 0.4	3.9 ± 0.3	3.4 ± 0.2	3.4 ± 0.3	19.8 miles @ 170°
51	Liberty & Bronson Sts., E of OSS	4.9 ± 0.5	4.2 ± 0.2	3.7 ± 0.1	3.8 ± 0.2	7.4 miles @ 233°

TABLE 6-10 (continued)

DIRECT RADIATION MEASUREMENT RESULTS - 2002

Results in Units of mrem/std. Month ± 1 Sigma

LOCATION NUMBER	LOCATION	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	LOCATION (DISTANCE AND DIRECTION)(1)
52	E.12th & Cayuga Sts., Oswego School	5.0 ± 0.3	4.1 ± 0.2	3.7 ± 0.1	3.8 ± 0.2	5.8 miles @ 227°
53	Broadwell & Chestnut Sts. Fulton H.S.	4.9 ± 0.4	4.3 ± 0.3	4.5 ± 0.1	3.9 ± 0.2	13.7 miles @ 183°
54	Liberty St. & Co. Rt. 16 Mexico H.S.	4.7 ± 0.2	4.1 ± 0.2	4.2 ± 0.2	3.8 ± 0.2	9.3 miles @ 115°
55	Gas Substation Co. Rt. 5-Pulaski	4.5 ± 0.2	4.1 ± 0.1	4.0 ± 0.1	3.7 ± 0.5	13.0 miles @ 75°
56*	Rt. 104-New Haven Sch. (SE Corner)	4.6 ± 0.3	4.6 ± 0.3	4.4 ± 0.2	3.8 ± 0.3	5.3 miles @ 123°
58*	Co. Rt. 1A-Alcan (E. of E. Entrance Rd.	4.7 ± 0.2	4.1 ± 0.2	4.2 ± 0.2	3.5 ± 0.1	3.1 miles @ 220°
75*	Unit 2, N. Fence, N. of Reactor Bldg.	7.5 ± 0.3	7.1 ± 0.2	6.8 ± 0.5	6.0 ± 0.1	0.1 miles @ 5°
76*	Unit 2, N. Fence, N. of Change House	6.1 ± 0.4	6.1 ± 0.4	5.3 ± 0.4	4.9 ± 0.4	0.1 miles @ 25°
77*	Unit 2, N. Fence, N. of Pipe Bldg.	6.8 ± 0.3	6.7 ± 0.4	6.0 ± 0.3	5.1 ± 0.3	0.2 miles @ 45°
78*	JAF. E. of E. Old Lay Down Area	5.1 ± 0.3	4.7 ± 0.2	4.2 ± 0.2	4.5 ± 0.4	1.0 miles @ 90°
79*	Co. Rt.29, Pole #63, 0.2 mi. s. of Lake Rd.	4.6 ± 0.1	4.2 ± 0.3	4.4 ± 0.2	3.6 ± 0.2	1.1 miles @ 115°
80*	Co Rt. 29, Pole #54, 0.7 mi. S. of Lake Rd.	4.7 ± 0.3	4.4 ± 0.2	4.2 ± 0.2	3.6 ± 0.2	1.4 miles @ 133°
81*	Miner Rd., Pole #16, 0.5 mi. W. of Rt.29	4.8 ± 0.4	4.2 ± 0.4	4.2 ± 0.3	3.6 ± 0.4	1.6 miles @ 159°
82*	Miner Rd., Pole #1-1/2, 1.1 mi. W. of Rt.29	4.6 ± 0.2	4.2 ± 0.4	4.5 ± 0.4	3.8 ± 0.3	1.6 miles @ 181°
83*	Lakeview Rd., Tree 0.45 mi. N. of Miner Rd.	4.6 ± 0.4	4.3 ± 0.3	4.5 ± 0.5	3.7 ± 0.4	1.2 miles @ 200°
84*	Lakeview Rd., N., Pole #6117, 200ft. N. of Lake Rd.	4.7 ± 0.2	4.5 ± 0.2	4.5 ± 0.4	4.6 ± 0.3	1.1miles @ 225°
85*	Unit 1, N. Fence, N. of W. Side of Screen House	9.1 ± 0.4	8.7 ± 0.3	9.4 ± 0.5	7.0 ± 0.3	0.2 miles @ 294°
86*	Unit 2, N. Fence, of W. Side of Screen House	7.8 ± 0.3	7.2 ± 0.4	7.8 ± 0.4	7.1 ± 0.3	0.1 miles @ 315°
87*	Unit 2, N. Fence. N. of E. Side of Screen House	7.8 ± 0.2	7.3 ± 0.5	7.9 ± 0.6	6.6 ± 0.4	0.1 miles @ 341°
88*	Hickory Grove Rd., Pole#2, 0.6 mi. N. of Rt.1	4.5 ± 0.2	4.0 ± 0.2	4.4 ± 0.5	4.1 ± 0.3	4.8 miles @ 97°
89*	Leavitt Rd., Pole #16, 0.4 mi. S. of Rt.1	5.1 ± 0.3	4.4 ± 0.2	5.0 ± 0.2	4.7 ± 0.4	4.1 miles @ 111°
90*	Rt. 104, Pole #300, 150 ft. E. of Keefe Rd.	4.4 ± 0.3	4.0 ± 0.1	4.1 ± 0.3	3.3 ± 0.2	4.2 miles @ 135°
91*	Rt. 51A, Pole #59, 0.8 mi. W. of Rt.51	Lost (2)	4.7 ± 0.7	4.0 ± 0.2	3.1 ± 0.1	4.8 miles @ 156°
92*	Maiden Lane Rd., Power Pole, 0.6 mi. S. of Rt. 104	4.9 ± 0.4	5.3 ± 0.4	4.4 ± 0.2	3.8 ± 0.5	4.4 miles @ 183°
93*	Rt. 53 Pole 1-1, 120 ft. S. of Rt. 104	4.2 ± 0.2	4.2 ± 0.2	3.9 ± 0.1	3.7 ± 0.3	4.4 miles @ 205°

TABLE 6-10 (continued)

DIRECT RADIATION MEASUREMENT RESULTS - 2002

Results in Units of mrem/std. Month ± 1 Sigma

LOCATION NUMBER	LOCATION	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	LOCATION (DISTANCE AND DIRECTION)(1)
94*	Rt. 1, Pole #82, 250 ft. E. of Kocher Rd. (Co. Rt. #63)	4.6 ± 0.3	4.0 ± 0.1	3.9 ± 0.2	3.8 ± 0.2	4.7 miles @ 223°
95*	Lakeshore Campsite, from alcanW. Access Rd., Ple#21, 1.2 mi. N. of Rt.1	4.3 ± 0.3	3.8 ± 0.3	3.6 ± 0.3	3.5 ± 0.1	4.1 miles @ 237°
96*	Creamery Rd., 0.3 mi. S. of Middle Rd., Pole 1-1/2	4.5 ± 0.1	4.1 ± 0.1	4.1 ± 0.2	4.0 ± 0.3	3.6 miles @ 199°
97*	Rt. 29, Pole #50, 200 ft. N. of Miner Rd.	4.7 ± 0.2	4.2 ± 0.1	3.9 ± 0.2	4.0 ± 0.2	1.8 miles @ 143°
98*	Lake Rd., Pole #145, 0.15 mi. E. of Rt. 29	4.7 ± 0.2	4.1 ± 0.2	4.3 ± 0.2	3.7 ± 0.6	1.2 miles @ 101°
99	NMP Rd., 0.4 mi. N. of Lake Rd., Env. Station R1 Off-site	4.9 ± 0.4	4.5 ± 0.1	4.5 ± 0.1	4.2 ± 0.2	1.8 miles @ 88°
100	Rt. 29 & Lake Rd., Env. Station R2 Off-site	5.1 ± 0.2	4.4 ± 0.2	4.4 ± 0.3	3.5 ± 0.2	1.1 miles @ 104°
101	Rt. 29, 0.7 mi. S. of Lake Rd., Env. Station R3 Off-site	4.6 ± 0.2	4.2 ± 0.3	3.8 ± 0.2	3.9 ± 0.2	1.5 miles @ 132°
102	EOF/Env. Lab, Oswego Co. Airport (Fulton Airport, Rt. 176) E. Driveway, Lamp Post	4.8 ± 0.5	4.2 ± 0.2	4.0 ± 0.2	3.2 ± 0.1	11.9 miles @ 175°
103	EIC, East Garage Rd., Lamp Post, R3 Off-site	5.3 ± 0.3	4.9 ± 0.2	4.5 ± 0.3	3.7 ± 0.2	0.4 miles @ 267°
104	Parkhurst Road, Pole #148-1/2A, 0.1 mi. S. of Lake Rd.	4.6 ± 0.2	4.2 ± 0.1	4.0 ± 0.3	3.7 ± 0.3	1.4 miles @ 102°
105	Lakeview Rd. Pole #6125, 0.6 mi. S. of Lake Rd.	4.9 ± 0.1	4.1 ± 0.4	4.1 ± 0.2	3.3 ± 0.2	1.4 miles @ 198°
106	Shoreline Cove, W. of NMP-1, Tree on W. Edge	5.5 ± 0.2	5.1 ± 0.2	4.7 ± 0.4	5.2 ± 0.2	0.3 miles @ 274°
107	Shoreline Cove, W. of NMP-1	5.5 ± 0.2	5.1 ± 0.3	4.7 ± 0.3	5.0 ± 0.4	0.3 miles @ 272°
108	Lake Rd., Pole #142, 300 ft. E. of Rt. 29 S.	4.9 ± 0.2	4.2 ± 0.1	4.0 ± 0.2	4.1 ± 0.2	1.1 miles @ 104°
109	Tree North of Lake Rd., 300 ft. E. of Rt. 29 N.	4.8 ± 0.2	4.3 ± 0.1	3.9 ± 0.3	3.5 ± 0.1	1.1 miles @ 103°
111	Sterling, NY	4.8 ± 0.6	4.2 ± 0.5	3.9 ± 0.2	3.8 ± 0.3	26.4 miles @ 166°
112	EOF/Env. Lab, Oswego Co. Airport	4.7 ± 0.1	4.1 ± 0.3	3.9 ± 0.2	3.8 ± 0.2	11.9 miles @ 175°
113	Control, Baldwinsville, NY	5.0 ± 0.3	3.8 ± 0.2	3.7 ± 0.2	3.4 ± 0.2	21.8 miles @ 214°

(1) Direction and distance based on NMP-2 reactor centerline and sixteen 22.5° sector grid.
(2) TLD lost in the field.
* TLD required by TS/ODCM

TABLE 6-11

CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK - 2002

Results in Units of pCi/liter ± 1 Sigma

SAMPLE LOCATION No. 4***						
COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba/La-140	OTHERS†
04/08/02	<0.396	1720 ± 50	<2.60	<4.07	<4.06	<LLD
04/22/02	<0.429	1630 ± 66	<5.13	<5.43	<5.80	<LLD
05/06/02	<0.352	1410 ± 81	<7.52	<7.62	<8.73	<LLD
05/20/02	<0.401	1670 ± 87	<5.82	<6.40	<7.42	<LLD
06/03/02	<0.582	1540 ± 66	<4.52	<5.72	<6.22	<LLD
06/17/02	<0.410	1580 ± 66	<4.02	<5.33	<5.41	<LLD
07/08/02	<0.491	1550 ± 66	<5.14	<5.18	<4.45	<LLD
07/22/02	<0.357	1540 ± 63	<4.81	<4.47	<6.17	<LLD
08/05/02	<0.517	1520 ± 76	<5.28	<5.85	<5.69	<LLD
08/19/02	<0.434	1650 ± 58	<3.24	<5.18	<4.96	<LLD
09/09/02	<0.381	2260 ± 59	<2.40	<4.27	<4.01	<LLD
09/23/02	<0.450	1570 ± 68	<5.30	<5.39	<6.13	<LLD
10/07/02	<0.461	1530 ± 84	<6.11	<7.45	<8.00	<LLD
10/21/02	<0.406	1600 ± 86	<6.23	<6.45	<6.90	<LLD
11/04/02	<0.411	1620 ± 49	<4.36	<3.96	<4.57	<LLD
11/18/02	<0.418	1480 ± 64	<5.43	<5.42	<5.80	<LLD
12/02/02	<0.377	1610 ± 85	<6.52	<6.57	<7.57	<LLD
12/16/02	<0.530	1360 ± 76	<5.98	<6.06	<7.64	<LLD

SAMPLE LOCATION No. 50***						
COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba/La-140	OTHERS†
04/08/02	<0.363	1590 ± 69	<3.59	<5.16	<7.33	<LLD
04/22/02	<0.371	1470 ± 65	<5.30	<5.25	<5.13	<LLD
05/06/02	<0.423	1450 ± 62	<4.70	<4.88	<4.55	<LLD
05/20/02	<0.450	1490 ± 65	<4.81	<5.18	<7.03	<LLD
06/03/02	<0.580	1400 ± 62	<5.19	<4.81	<5.94	<LLD
06/17/02	<0.456	1590 ± 64	<4.59	<4.61	<5.62	<LLD
07/08/02	<0.483	1590 ± 49	<4.42	<3.85	<4.76	<LLD
07/22/02	<0.421	1740 ± 72	<5.63	<5.34	<7.04	<LLD
08/05/02	<0.421	1500 ± 76	<6.27	<7.19	<6.20	<LLD
08/19/02	<0.518	1490 ± 74	<5.69	<6.01	<7.50	<LLD
09/09/02	<0.453	1420 ± 63	<4.53	<5.09	<5.61	<LLD
09/23/02	<0.448	1570 ± 70	<6.64	<6.18	<7.43	<LLD
10/07/02	<0.394	1530 ± 67	<4.74	<5.05	<6.14	<LLD
10/21/02	<0.494	1610 ± 71	<5.92	<5.69	<6.80	<LLD
11/04/02	<0.511	1660 ± 72	<3.82	<5.74	<6.56	<LLD
11/18/02	<0.382	1370 ± 77	<6.81	<6.57	<6.31	<LLD
12/02/02	<0.511	1610 ± 67	<3.14	<4.77	<6.38	<LLD
12/16/02	<0.438	1530 ± 65	<4.74	<5.42	<6.68	<LLD

*** Corresponds to sample location noted on Figure 3.3-4.

† Plant related radionuclides.

TABLE 6-11 (continued)

CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK - 2002

Results in Units of pCi/liter ± 1 Sigma

SAMPLE LOCATION No. 55***						
COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba/La-140	OTHERS†
04/08/02	<0.475	1510 ± 65	<4.62	<4.68	<4.58	<LLD
04/22/02	<0.449	1480 ± 65	<5.31	<4.93	<5.89	<LLD
05/06/02	<0.349	1580 ± 49	<2.45	<4.15	<4.80	<LLD
05/20/02	<0.346	1480 ± 65	<5.08	<5.48	<5.40	<LLD
06/03/02	<0.349	1490 ± 65	<4.30	<4.68	<5.40	<LLD
06/17/02	<0.389	1690 ± 88	<7.13	<7.16	<6.36	<LLD
07/08/02	<0.373	1630 ± 70	<3.91	<5.28	<6.56	<LLD
07/22/02	<0.367	1590 ± 67	<5.92	<5.34	<4.82	<LLD
08/05/02	<0.413	1670 ± 79	<5.31	<5.57	<5.43	<LLD
08/19/02	<0.542	1480 ± 75	<6.38	<6.72	<5.63	<LLD
09/09/02	<0.491	1760 ± 52	<2.81	<4.12	<5.06	<LLD
09/23/02	<0.474	1700 ± 51	<2.84	<4.18	<4.55	<LLD
10/07/02	<0.515	1560 ± 66	<4.72	<4.50	<3.88	<LLD
10/21/02	<0.413	1640 ± 50	<2.85	<3.72	<2.36	<LLD
11/04/02	<0.428	1380 ± 62	<5.25	<5.41	<7.05	<LLD
11/18/02	<0.448	1740 ± 71	<5.90	<5.57	<3.97	<LLD
12/02/02	<0.392	1710 ± 71	<5.68	<5.40	<6.52	<LLD
12/16/02	<0.448	1540 ± 64	<4.87	<4.32	<4.90	<LLD

SAMPLE LOCATION No. 60***						
COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba/La-140	OTHERS†
04/07/02	<0.495	1430 ± 64	<3.77	<5.64	<6.58	<LLD
04/21/02	<0.465	1720 ± 51	<2.32	<4.04	<3.73	<LLD
05/05/02	<0.436	1550 ± 67	<5.03	<5.18	<5.52	<LLD
05/19/02	<0.385	1610 ± 70	<3.85	<5.34	<8.01	<LLD
06/02/02	<0.512	1480 ± 84	<6.42	<6.66	<9.62	<LLD
06/16/02	<0.726	1760 ± 72	<5.91	<5.57	<6.17	<LLD
07/08/02	<0.456	1600 ± 68	<5.24	<5.42	<5.29	<LLD
07/21/02	<0.357	1580 ± 66	<5.03	<5.33	<4.69	<LLD
08/04/02	<0.409	1410 ± 91	<8.16	<8.03	<10.9	<LLD
08/18/02	<0.477	1350 ± 91	<6.76	<8.22	<11.5	<LLD
09/09/02	<0.484	1780 ± 74	<5.47	<5.25	<7.57	<LLD
09/23/02	<0.437	1640 ± 71	<3.44	<5.38	<7.13	<LLD
10/07/02	<0.441	1690 ± 72	<3.56	<5.18	<7.67	<LLD
10/21/02	<0.426	1600 ± 50	<2.62	<4.35	<4.11	<LLD
11/04/02	<0.424	1560 ± 82	<6.52	<5.64	<8.03	<LLD
11/18/02	<0.477	1660 ± 70	<5.49	<5.57	<7.56	<LLD
12/02/02	<0.433	1510 ± 64	<4.93	<5.32	<5.42	<LLD
12/16/02	<0.354	1520 ± 66	<4.56	<4.68	<4.05	<LLD

*** Corresponds to sample location noted on Figure 3.3-4.
† Plant related radionuclides.

TABLE 6-11 (continued)

CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK - 2002

Results in Units of pCi/liter ± 1 Sigma

SAMPLE LOCATION No. 76***						
COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba/La-140	OTHERS†
04/08/02	<0.546	1410 ± 81	<6.29	<6.79	<9.18	<LLD
04/22/02	<0.365	1620 ± 70	<5.94	<5.22	<6.80	<LLD
05/06/02	<0.444	1580 ± 67	<5.03	<5.02	<4.43	<LLD
05/20/02	<0.412	1410 ± 61	<4.41	<5.32	<5.78	<LLD
06/03/02	<0.518	1560 ± 70	<6.69	<6.26	<9.00	<LLD
06/17/02	<0.483	1610 ± 49	<2.67	<4.12	<3.65	<LLD
07/08/02	<0.382	1730 ± 52	<2.64	<4.07	<4.94	<LLD
07/22/02	<0.428	1670 ± 86	<5.51	<6.69	<7.98	<LLD
08/05/02	<0.467	1750 ± 85	<7.50	<7.08	<10.7	<LLD
08/19/02	<0.551	1680 ± 82	<7.36	<5.72	<1.34	<LLD
09/09/02	<0.470	1700 ± 72	<4.91	<5.63	<8.24	<LLD
09/23/02	<0.548	1590 ± 67	<5.18	<4.18	<4.74	<LLD
10/07/02	<0.563	1560 ± 86	<6.79	<6.97	<6.32	<LLD
10/21/02	<0.496	1630 ± 68	<4.90	<5.90	<6.95	<LLD
11/04/02	<0.530	1490 ± 65	<3.89	<5.49	<6.13	<LLD
11/18/02	<0.391	1650 ± 50	<2.76	<4.01	<4.44	<LLD
12/02/02	<0.516	1590 ± 49	<2.32	<3.76	<4.34	<LLD
12/16/02	<0.382	1460 ± 64	<4.62	<4.31	<5.38	<LLD

SAMPLE LOCATION No. 77*** (Control)*						
COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba/La-140	OTHERS†
04/08/02	<0.432	1530 ± 65	<5.43	<5.26	<5.12	<LLD
04/22/02	<0.392	1600 ± 67	<5.74	<5.93	<6.67	<LLD
05/06/02	<0.356	1700 ± 72	<5.82	<5.10	<6.83	<LLD
05/20/02	<0.344	1560 ± 66	<5.30	<5.34	<4.42	<LLD
06/03/02	<0.507	1440 ± 69	<5.47	<6.51	<5.89	<LLD
06/17/02	<0.466	1560 ± 66	<5.10	<5.18	<5.13	<LLD
07/08/02	<0.373	1680 ± 66	<4.47	<5.26	<4.24	<LLD
07/22/02	<0.549	1750 ± 52	<2.61	<3.70	<3.49	<LLD
08/05/02	<0.484	1720 ± 59	<3.24	<4.21	<4.81	<LLD
08/19/02	<0.416	1660 ± 82	<5.88	<6.62	<6.19	<LLD
09/09/02	<0.391	1800 ± 53	<2.53	<3.82	<3.79	<LLD
09/23/02	<0.509	1620 ± 50	<4.14	<4.10	<3.43	<LLD
10/07/02	<0.504	1500 ± 66	<5.09	<5.72	<6.35	<LLD
10/21/02	<0.465	1310 ± 63	<5.59	<6.53	<6.38	<LLD
11/04/02	<0.504	1510 ± 63	<5.19	<4.61	<5.89	<LLD
11/17/02	<0.480	1740 ± 50	<2.79	<3.90	<4.27	<LLD
12/02/02	<0.478	1510 ± 64	<5.29	<4.95	<5.62	<LLD
12/16/02	<0.391	1650 ± 50	<3.81	<4.03	<3.77	<LLD

*** Corresponds to sample location noted on Figure 3.3-4.
* Sample location required by TS/ODCM.
† Plant related radionuclides.

TABLE 6-12

CONCENTRATIONS OF GAMMA EMITTERS IN FOOD PRODUCTS - 2002

Results in Units of pCi/g (wet) ± 1 Sigma

COLLECTION SITE	SAMPLE DATE	DESCRIPTION	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65
133*	09/24/2002	Grape Leaves	1.13 ± 0.069	4.80 ± 0.168	< 0.018	< 0.012	< 0.016	< 0.048
		Pepper Leaves	0.261 ± 0.039	9.79 ± 0.166	< 0.015	< 0.009	< 0.013	< 0.020
		Tomatoes	< 0.057	2.15 ± 0.087	< 0.010	< 0.008	< 0.007	< 0.020
132*	09/17/02	Squash Leaves	1.01 ± 0.036	2.93 ± 0.084	< 0.007	< 0.007	< 0.007	< 0.019
		Pepper Leaves	0.234 ± 0.022	5.16 ± 0.101	< 0.007	< 0.005	< 0.006	< 0.016
		Tomatoes	< 0.035	2.20 ± 0.055	< 0.005	< 0.004	< 0.004	< 0.011
143**	09/17/02	Squash Leaves	1.29 ± 0.057	4.96 ± 0.147	< 0.014	< 0.009	< 0.012	< 0.034
		Tomatoes	< 0.030	2.99 ± 0.049	< 0.004	< 0.002	< 0.004	< 0.006
		Cabbage	0.303 ± 0.045	4.99 ± 0.164	< 0.015	< 0.015	< 0.014	< 0.033
		Pepper Leaves	0.789 ± 0.044	7.56 ± 0.159	< 0.011	< 0.010	< 0.012	< 0.028
342**	09/18/02	Squash Leaves	1.45 ± 0.056	4.44 ± 0.133	< 0.012	< 0.008	< 0.011	< 0.030
145* (Control)	09/24/02	Squash Leaves	0.354 ± 0.043	4.13 ± 0.140	< 0.014	< 0.014	< 0.013	< 0.034
		Tomatoes	< 0.050	2.68 ± 0.081	< 0.008	< 0.008	< 0.006	< 0.017
		Cabbage	0.153 ± 0.035	4.56 ± 0.141	< 0.014	< 0.015	< 0.012	< 0.029
		Pepper Leaves	0.249 ± 0.052	10.6 ± 0.219	< 0.018	< 0.011	< 0.015	< 0.047
		Grape Leaves	0.782 ± 0.051	3.89 ± 0.118	< 0.017	< 0.010	< 0.014	< 0.019

* Sample location required by TS/ODCM.
** Optional sample location.
Note: Other plant related radionuclides <LLD.

TABLE 6-13

MILK ANIMAL CENSUS 2002

TOWN OR AREA [a]	NUMBER ON CENSUS MAP [1]	DEGREES [2]	DISTANCE [2] (miles)	NUMBER OF MILK ANIMALS
Scriba	3	190°	4.5	NONE
	62	183°	6.7	4G[3]
New Haven	75	146°	7.5	1C
	9	95°	5.2	45C
	4*	113°	7.8	100C
	64	107°	7.9	48C
Mexico	14	120°	9.8	56C
	19	132°	10.5	5C
	60*	90°	9.5	27C
	76*	132°	5.2	56C
	50*	93°	9.1	110C
	55*	95°	9.0	52C
	21	112°	10.5	70C
	72	98°	9.9	37C
Sterling	73*	234°	13.9	NONE
Richland	22	85°	13.9	2C
Volney	25	182°	9.5	NONE
	63	185°	8.0	NONE
Granby (Control)	77**	191°	13.9	70C

MILKING ANIMAL TOTALS: 679 Cows
(including control locations) 4 Goats

MILKING ANIMAL TOTALS: 609 Cows
(excluding control locations) 4 Goats

NOTES:

C = Cows
G = Goats
* = Milk sample location
** = Milk sample control location
(1) = Reference Figure 3.3-4
(2) = Degrees and distance are based on NMP-2 reactor building centerline
(3) = Goat is not currently producing milk or any milk produced is utilized by the owner
NONE = No cows or goats at that location. Location was a previous location with cows and/or goats
(a) = Census performed out to a distance of approximately 10 miles

TABLE 6-14

2002 RESIDENCE CENSUS

LOCATION	MAP LOCATION (1)	METEOROLOGICAL SECTOR	DEGREES (2)	DISTANCE (2)
*		N	-	-
*		NNE	-	-
*		NE	-	-
*		ENE	-	-
Lake Road	A	E	97°	1.3 miles
Lake Road	B	ESE	102°	1.1 miles
County Route 29	C	SE	130°	1.4 miles
Miner Road	D	SSE	163°	1.6 miles
Miner Road	E	S	170°	1.6 miles
Lakeview Road	F	SSW	207°	1.2 miles
Bible Camp Retreat	G	SW	234°	0.9 miles
Bible Camp Retreat	H	WSW	238°	0.9 miles
*		W	-	-
*		WNW	-	-
*		NW	-	-
*		NNW	-	-

NOTES:

* This meteorological sector is over Lake Ontario. There is no residence within five miles
(1) Corresponds to Figure 3.3-5
(2) Based on NMP2 reactor centerline

SECTION 7.0

HISTORICAL DATA TABLES

TABLE 7-1

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SHORELINE SEDIMENT (CONTROL) (1)

	Cs-137 (pCi/g (dry))			Co-60 (pCi/g (dry))		
YEAR	MIN	MAX	MEAN	MIN	MAX	MEAN
1979 (2)	0.22	0.22	0.22	LLD	LLD	LLD
1980	0.07	0.09	0.08	LLD	LLD	LLD
1981	LLD	LLD	LLD	LLD	LLD	LLD
1982	0.05	0.05	0.05	LLD	LLD	LLD
1983	LLD	LLD	LLD	LLD	LLD	LLD
1984	LLD	LLD	LLD	LLD	LLD	LLD
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	LLD	LLD	LLD	LLD	LLD	LLD
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	0.03	0.03	0.03	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) Control location was at an area beyond the influence of the site (westerly direction).
(2) Sampling was initiated in 1979. Sampling was not required prior to 1979.

TABLE 7-2

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SHORELINE SEDIMENT (INDICATOR) [1]

	Cs-137 (pCi/g (dry))			Co-60 (pCi/g (dry))		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1979	(2)	(2)	(2)	(2)	(2)	(2)
1980	(2)	(2)	(2)	(2)	(2)	(2)
1981	(2)	(2)	(2)	(2)	(2)	(2)
1982	(2)	(2)	(2)	(2)	(2)	(2)
1983	(2)	(2)	(2)	(2)	(2)	(2)
1984	(2)	(2)	(2)	(2)	(2)	(2)
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	LLD	LLD	LLD	LLD	LLD	LLD
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	0.25	0.34	0.30	LLD	LLD	LLD
1990	0.28	0.28	0.28	LLD	LLD	LLD
1991	0.11	0.16	0.14	LLD	LLD	LLD
1992	0.10	0.16	0.13	LLD	LLD	LLD
1993	0.17	0.49	0.33	LLD	LLD	LLD
1994	0.08	0.39	0.24	LLD	LLD	LLD
1995	0.16	0.17	0.16	LLD	LLD	LLD
1996	0.13	0.18	0.16	LLD	LLD	LLD
1997	0.13	0.18	0.16	LLD	LLD	LLD
1998	0.07	0.07	0.07	LLD	LLD	LLD
1999	0.06	0.09	0.08	LLD	LLD	LLD
2000	0.06	0.08	0.07	LLD	LLD	LLD
2001	0.06	0.07	0.07	LLD	LLD	LLD
2002	0.05	0.05	0.05	LLD	LLD	LLD

(1) Location was off-site at Sunset Beach (closest location with recreational value).
(2) Sampling initiated in 1985 as required by the new Technical Specifications.

TABLE 7-3

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FISH (CONTROL) [1]

	Cs-137 (pCi/g (wet))		
YEAR	MIN.	MAX.	MEAN
1976	1.2	1.2	1.2
1977	0.13	0.13	0.13
1978	0.04	0.20	0.09
1979	0.03	0.06	0.04
1980	0.03	0.11	0.06
1981	0.028	0.062	0.043
1982	0.027	0.055	0.046
1983	0.041	0.057	0.049
1984	0.015	0.038	0.032
1985	0.026	0.047	0.034
1986	0.021	0.032	0.025
1987	0.017	0.040	0.031
1988	0.023	0.053	0.033
1989	0.020	0.033	0.029
1990	0.025	0.079	0.043
1991	0.016	0.045	0.030
1992	0.019	0.024	0.022
1993	0.023	0.041	0.032
1994	0.012	0.035	0.024
1995	0.014	0.020	0.016
1996	0.014	0.018	0.016
1997	0.019	0.043	0.031
1998	0.013	0.013	0.013
1999	LLD	LLD	LLD
2000	0.02	0.02	0.02
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD

(1) Control location was at an area beyond the influence of the site (westerly direction).

TABLE 7-4

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FISH (INDICATOR) [1]

	Cs-137 (pCi/g (wet))		
YEAR	MIN.	MAX.	MEAN
1976	0.5	3.9	1.4
1977	0.13	0.79	0.29
1978	0.03	0.10	0.08
1979	0.02	0.55	0.10
1980	0.03	0.10	0.06
1981	0.03	0.10	0.06
1982	0.034	0.064	0.048
1983	0.033	0.056	0.045
1984	0.033	0.061	0.043
1985	0.018	0.044	0.030
1986	0.009	0.051	0.028
1987	0.024	0.063	0.033
1988	0.020	0.074	0.034
1989	0.020	0.043	0.035
1990	0.024	0.115	0.044
1991	0.021	0.035	0.027
1992	0.013	0.034	0.026
1993	0.021	0.038	0.030
1994	0.011	0.028	0.020
1995	0.016	0.019	0.018
1996	0.014	0.016	0.015
1997	0.015	0.017	0.016
1998	0.021	0.021	0.021
1999	0.016	0.018	0.017
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	0.016	0.016	0.016

(1) Indicator locations are in the general area of the NMP-1 and J. A. FitzPatrick cooling water discharge structures.

TABLE 7-5

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SURFACE WATER (CONTROL) [3]

	Cs-137 (pCi/liter)			Co-60 (pCi/liter)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1976	(1)	(1)	(1)	(1)	(1)	(1)
1977	(2)	(2)	(2)	(2)	(2)	(2)
1978	LLD	LLD	LLD	(2)	(2)	(2)
1979	2.5	2.5	2.5	LLD	LLD	LLD
1980	LLD	LLD	LLD	LLD	LLD	LLD
1981	LLD	LLD	LLD	1.4	1.4	1.4
1982	LLD	LLD	LLD	LLD	LLD	LLD
1983	LLD	LLD	LLD	LLD	LLD	LLD
1984	LLD	LLD	LLD	LLD	LLD	LLD
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	LLD	LLD	LLD	LLD	LLD	LLD
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) No gamma analyses performed (not required).
(2) Data showed instrument background results.
(3) Location was the City of Oswego Water Supply for 1976 - 1984 and the Oswego Steam Station inlet canal for 1985 – 2002.

TABLE 7-6

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SURFACE WATER (INDICATOR) [3]

	Cs-137 (pCi/liter)			Co-60 (pCi/liter)		
YEAR	MIN	MAX	MEAN	MIN	MAX	MEAN
1976	(1)	(1)	(1)	(1)	(1)	(1)
1977	(2)	(2)	(2)	(2)	(2)	(2)
1978	LLD	LLD	LLD	(2)	(2)	(2)
1979	LLD	LLD	LLD	LLD	LLD	LLD
1980	LLD	LLD	LLD	LLD	LLD	LLD
1981	LLD	LLD	LLD	LLD	LLD	LLD
1982	0.43	0.43	0.43	1.6	2.4	1.9
1983	LLD	LLD	LLD	LLD	LLD	LLD
1984	LLD	LLD	LLD	LLD	LLD	LLD
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	LLD	LLD	LLD	LLD	LLD	LLD
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) No gamma analyses performed (not required).
(2) Data showed instrument background results.
(3) Location was the J. A. FitzPatrick inlet canal.

TABLE 7-7

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SURFACE WATER TRITIUM (CONTROL) [1]

	TRITIUM (pCi/liter)		
YEAR	MIN	MAX	MEAN
1976	440	929	652
1977	300	530	408
1978	215	490	304
1979	174	308	259
1980	211	290	257
1981	211	328	276
1982	112	307	165
1983	230	280	250
1984	190	220	205
1985	230	370	278
1986	250	550	373
1987	140	270	210
1988	240	460	320
1989	180	660	373
1990	260	320	290
1991	180	200	190
1992	190	310	242
1993	160	230	188
1994	250	250	250
1995	230	230	230
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	190	190	190
1999	220	510	337
2000	196	237	212
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD

(1) Control location is the City of Oswego drinking water for 1976 - 1984 and the Oswego Steam Station inlet canal for 1985 - 2002

TABLE 7-8

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SURFACE WATER TRITIUM (INDICATOR) (1)

	TRITIUM (pCi/liter)		
YEAR	MIN	MAX	MEAN
1976	365	889	627
1977	380	530	455
1978	377	560	476
1979	176	276	228
1980	150	306	227
1981	212	388	285
1982	194	311	266
1983	249	560	347
1984	110	370	280
1985	250	1200 (2)	530
1986	260	500	380
1987	160	410	322
1988	430	480	460
1989	210	350	280
1990	220	290	250
1991	250	390	310
1992	240	300	273
1993	200	280	242
1994	180	260	220
1995	320	320	320
1996	LLD	LLD	LLD
1997	160	160	160
1998	190	190	190
1999	180	270	233
2000	161	198	185
2001	LLD	LLD	LLD
2002	297	297	297

(1) Indicator location is the FitzPatrick inlet canal.
(2) Suspect sample contamination. Recollected samples showed normal levels of tritium.

TABLE 7-9

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATE GROSS BETA (CONTROL) (1)

	GROSS BETA (pCi/m^3)		
YEAR	MIN	MAX	MEAN
1977	0.001	0.484	0.125
1978	0.01	0.66	0.16
1979	0.010	0.703	0.077
1980	0.009	0.291	0.056
1981	0.016	0.549	0.165
1982	0.011	0.078	0.033
1983	0.007	0.085	0.024
1984	0.013	0.051	0.026
1985	0.013	0.043	0.024
1986	0.008	0.272	0.039
1987	0.009	0.037	0.021
1988	0.008	0.039	0.018
1989	0.007	0.039	0.017
1990	0.003	0.027	0.013
1991	0.006	0.028	0.014
1992	0.006	0.020	0.012
1993	0.007	0.022	0.013
1994	0.008	0.025	0.015
1995	0.006	0.023	0.014
1996	0.008	0.023	0.014
1997	0.006	0.025	0.013
1998	0.004	0.034	0.014
1999	0.010	0.032	0.017
2000	0.006	0.027	0.015
2001	0.006	0.034	0.016
2002	0.008	0.027	0.016

(1) Locations used for 1977 - 1984 were C off-site, D1 off-site, D2 off-site, E off-site, F off-site, and G off-site. Control location R-5 off-site was used for 1985 – 2002 (formerly C off-site location).

TABLE 7-10

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATE GROSS BETA (INDICATOR) (1)

	GROSS BETA (pCi/m^3)		
YEAR	MIN	MAX	MEAN
1977	0.002	0.326	0.106
1978	0.01	0.34	0.11
1979	0.001	0.271	0.058
1980	0.002	0.207	0.044
1981	0.004	0.528	0.151
1982	0.001	0.113	0.031
1983	0.002	0.062	0.023
1984	0.002	0.058	0.025
1985	0.010	0.044	0.023
1986	0.007	0.289	0.039
1987	0.009	0.040	0.021
1988	0.007	0.040	0.018
1989	0.007	0.041	0.017
1990	0.005	0.023	0.014
1991	0.007	0.033	0.015
1992	0.005	0.024	0.013
1993	0.005	0.025	0.014
1994	0.006	0.025	0.015
1995	0.004	0.031	0.014
1996	0.006	0.025	0.013
1997	0.001	0.018	0.010
1998	0.002	0.040	0.015
1999	0.009	0.039	0.017
2000	0.005	0.033	0.015
2001	0.004	0.037	0.016
2002	0.006	0.026	0.016

(1) Locations used for 1977 - 1984 were D1 on-site, D2 on-site, E on-site, F on-site, G on-site, H on-site, I on-site, J on-site, and K on-site as applicable. 1985 – 2002 locations were R-1 off-site, R-2 off-site, R-3 off-site, and R-4 off-site.

TABLE 7-11

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR RADIOIODINE (CONTROL) [1]

	IODINE-131 (pCi/m^3)		
YEAR	MIN.	MAX.	MEAN
1976	0.01	5.88	0.60
1977	0.02	0.82	0.32
1978	0.03	0.04	0.03
1979	LLD	LLD	LLD
1980	LLD	LLD	LLD
1981	LLD	LLD	LLD
1982	0.039	0.039	0.039
1983	LLD	LLD	LLD
1984	LLD	LLD	LLD
1985	LLD	LLD	LLD
1986	0.041	0.332	0.151
1987	LLD	LLD	LLD
1988	LLD	LLD	LLD
1989	LLD	LLD	LLD
1990	LLD	LLD	LLD
1991	LLD	LLD	LLD
1992	LLD	LLD	LLD
1993	LLD	LLD	LLD
1994	LLD	LLD	LLD
1995	LLD	LLD	LLD
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	LLD	LLD	LLD
1999	LLD	LLD	LLD
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD

(1) Locations D1 off-site, D2 off-site, E off-site, F off-site, and G off-site used for 1976 - 1984. Location R-5 off-site used for 1985 - 2002.

TABLE 7-12

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR RADIOIODINE (INDICATOR) (1)

	IODINE-131 (pCi/m^3)		
YEAR	MIN.	MAX.	MEAN
1976	0.01	2.09	0.33
1977	0.02	0.73	0.31
1978	0.02	0.07	0.04
1979	LLD	LLD	LLD
1980	0.013	0.013	0.013
1981	0.016	0.042	0.029
1982	0.002	0.042	0.016
1983	0.022	0.035	0.028
1984	LLD	LLD	LLD
1985	LLD	LLD	LLD
1986	0.023	0.360	0.119
1987	0.011	0.018	0.014
1988	LLD	LLD	LLD
1989	LLD	LLD	LLD
1990	LLD	LLD	LLD
1991	LLD	LLD	LLD
1992	LLD	LLD	LLD
1993	LLD	LLD	LLD
1994	LLD	LLD	LLD
1995	LLD	LLD	LLD
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	LLD	LLD	LLD
1999	LLD	LLD	LLD
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD

(1) Locations used for 1976 - 1984 were D1 on-site, D2 on-site, E on-site, F on-site, G on-site, H on-site, I on-site, J on-site, and K on-site, as applicable. Locations used for 1985 - 2002 were R1 off-site, R-2 off-site, R-3 off-site, and R-4 off-site.

TABLE 7-13

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATES (CONTROL) (1)

	Cs-137 (pCi/m^3)			Co-60 (pCi/m^3)		
YEAR	MIN	MAX	MEAN	MIN	MAX	MEAN
1977	0.0002	0.0112	0.0034	0.0034	0.0347	0.0172
1978	0.0008	0.0042	0.0018	0.0003	0.0056	0.0020
1979	0.0008	0.0047	0.0016	0.0005	0.0014	0.0009
1980	0.0015	0.0018	0.0016	LLD	LLD	LLD
1981	0.0003	0.0042	0.0017	0.0003	0.0012	0.0008
1982	0.0002	0.0009	0.0004	0.0004	0.0007	0.0006
1983	0.0002	0.0002	0.0002	0.0007	0.0007	0.0007
1984	LLD	LLD	LLD	0.0004	0.0012	0.0008
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	0.0075	0.0311	0.0193	LLD	LLD	LLD
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) Locations included composites of C, D1, E, F, and G off-site air monitoring locations for 1977 - 1984. Sample location included only R-5 air monitoring location for 1985 - 2002.

TABLE 7-14

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATES (INDICATOR) (1)

	Cs-137 (pCi/m^3)			Co-60 (pCi/m^3)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1977	0.0001	0.0105	0.0043	0.0003	0.0711	0.0179
1978	0.0003	0.0026	0.0016	0.0003	0.0153	0.0023
1979	0.0003	0.0020	0.0010	0.0003	0.0007	0.0005
1980	0.0005	0.0019	0.0011	0.0016	0.0016	0.0016
1981	0.0002	0.0045	0.0014	0.0002	0.0017	0.0006
1982	0.0001	0.0006	0.0004	0.0003	0.0010	0.0005
1983	0.0002	0.0003	0.0002	0.0003	0.0017	0.0007
1984	LLD	LLD	LLD	0.0007	0.0017	0.0012
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	0.0069	0.0364	0.0183	LLD	LLD	LLD
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	0.0048	0.0048	0.0048
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) Locations included composites of D1, D2, E, F, G, H, I, J, and K on-site air monitoring locations for 1977 - 1984. Locations included R-1 through R-4 air monitoring locations for 1985 - 2002.

TABLE 7-15

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (CONTROL) [2]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
Preop	(1)	(1)	(1)
1970	6.0	7.3	6.7
1971	2.0	6.7	4.3
1972	2.2	6.2	4.4
1973	2.2	6.9	4.7
1974	2.7	8.9	5.6
1975	4.8	6.0	5.5
1976	3.2	7.2	5.4
1977	4.0	8.0	5.3
1978	3.3	4.7	4.3
1979	3.3	5.7	4.7
1980	3.8	5.8	4.9
1981	3.5	5.9	4.8
1982	3.8	6.1	5.1
1983	4.9	7.2	5.8
1984	4.7	8.2	6.2
1985	4.5 (4.4)*	7.6 (6.8)*	5.6 (5.4)*
1986	5.3 (5.5)*	7.5 (7.2)*	6.3 (6.3)*
1987	4.6 (4.6)*	6.6 (5.8)*	5.4 (5.2)*
1988	4.4 (4.8)*	6.8 (6.8)*	5.6 (5.4)*
1989	2.9 (2.9)*	6.4 (5.6)*	4.7 (4.6)*
1990	3.7 (3.7)*	6.0 (5.9)*	4.8 (4.6)*
1991	3.8 (3.8)*	5.4 (5.3)*	4.5 (4.3)*
1992	2.6 (2.6)*	5.0 (4.7)*	4.1 (3.9)*
1993	3.4 (3.4)*	5.6 (5.2)*	4.4 (4.3)*
1994	3.1 (3.1)*	5.0 (4.6)*	4.1 (3.9)*
1995	3.4 (3.4)*	5.7 (4.9)*	4.4 (4.2)*
1996	3.4 (3.4)*	5.6 (5.6)*	4.3 (4.2)*
1997	3.7 (3.9)*	6.2 (5.2)*	4.7 (4.6)*
1998	3.7 (3.7)*	5.6 (4.8)*	4.4 (4.2)*
1999	3.6 (3.7)*	7.1 (4.7)*	4.6 (4.4)*
2000	3.7 (3.7)*	7.3 (5.5)*	4.7 (4.3)*
2001	3.6 (3.9)*	5.4 (5.0)*	4.4 (4.4)*
2002	3.4 (3.4)*	5.5 (5.2)*	4.3 (4.1)*

(1) Data not available.
(2) TLD #8, 14, 49, 111 and 113 where applicable.
( )* TLD result based on the TS/ODCM required locations (TLD #14 and 49).

TABLE 7-16

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (SITE BOUNDARY) [2]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
Preop	(1)	(1)	(1)
1970	(1)	(1)	(1)
1971	(1)	(1)	(1)
1972	(1)	(1)	(1)
1973	(1)	(1)	(1)
1974	(1)	(1)	(1)
1975	(1)	(1)	(1)
1976	(1)	(1)	(1)
1977	(1)	(1)	(1)
1978	(1)	(1)	(1)
1979	(1)	(1)	(1)
1980	(1)	(1)	(1)
1981	(1)	(1)	(1)
1982	(1)	(1)	(1)
1983	(1)	(1)	(1)
1984	(1)	(1)	(1)
1985	4.1	12.6	6.2
1986	4.4	18.7	7.0
1987	4.4	14.3	6.1
1988	3.4	17.9	6.4
1989	2.8	15.4	5.9
1990	3.6	14.8	5.8
1991	3.2	16.7	5.7
1992	3.2	10.4	4.8
1993	3.3	11.6	5.3
1994	2.8	12.4	5.2
1995	3.5	9.6	5.4
1996	3.2	9.1	5.2
1997	3.5	10.2	5.9
1998	3.7	9.4	5.4
1999	3.3	12.3	5.8
2000	3.6	10.0	5.5
2001	3.6	10.3	5.7
2002	3.5	9.4	5.4

(1) No data available (not required prior to 1985).
(2) TLD locations initiated in 1985 as required by the new Technical Specifications. Includes TLD numbers 75, 76, 77, 23, 78, 79, 80, 81, 82, 83, 84, 7, 18, 85, 86, and 87.

TABLE 7-17

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (Off-Site Sectors) [2]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
Preop	(1)	(1)	(1)
1970	(1)	(1)	(1)
1971	(1)	(1)	(1)
1972	(1)	(1)	(1)
1973	(1)	(1)	(1)
1974	(1)	(1)	(1)
1975	(1)	(1)	(1)
1976	(1)	(1)	(1)
1977	(1)	(1)	(1)
1978	(1)	(1)	(1)
1979	(1)	(1)	(1)
1980	(1)	(1)	(1)
1981	(1)	(1)	(1)
1982	(1)	(1)	(1)
1983	(1)	(1)	(1)
1984	(1)	(1)	(1)
1985	4.0	7.1	5.0
1986	4.6	8.6	6.0
1987	4.3	6.0	5.2
1988	3.8	7.0	5.3
1989	2.5	6.8	4.9
1990	3.6	6.3	4.7
1991	3.6	5.6	4.5
1992	2.9	5.0	4.1
1993	3.4	6.3	4.5
1994	3.0	5.1	4.0
1995	3.2	5.2	4.2
1996	3.2	5.3	4.2
1997	3.5	5.8	4.5
1998	3.5	5.0	4.2
1999	3.6	5.6	4.4
2000	3.4	6.6	4.5
2001	3.6	5.4	4.4
2002	3.1	5.3	4.2

(1) No data available (not required prior to 1985).
(2) TLD locations initiated in 1985 as required by the new Technical Specifications. Includes TLD numbers 88, 89, 90, 91, 92, 93, 94, and 95.

TABLE 7-18

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (Special Interest) (2) (3)

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
Preop	(1)	(1)	(1)
1970	(1)	(1)	(1)
1971	(1)	(1)	(1)
1972	(1)	(1)	(1)
1973	(1)	(1)	(1)
1974	(1)	(1)	(1)
1975	(1)	(1)	(1)
1976	(1)	(1)	(1)
1977	(1)	(1)	(1)
1978	(1)	(1)	(1)
1979	(1)	(1)	(1)
1980	(1)	(1)	(1)
1981	(1)	(1)	(1)
1982	(1)	(1)	(1)
1983	(1)	(1)	(1)
1984	(1)	(1)	(1)
1985	3.9	6.8	5.3
1986	4.8	8.2	6.1
1987	3.5	6.0	5.1
1988	3.9	6.6	5.3
1989	2.1	7.0	4.8
1990	3.2	6.3	4.7
1991	2.9	5.6	4.4
1992	3.0	4.8	4.1
1993	3.2	5.8	4.5
1994	2.9	4.8	4.0
1995	3.4	4.9	4.3
1996	3.2	5.3	4.2
1997	3.5	5.4	4.5
1998	3.7	4.9	4.3
1999	3.6	5.5	4.4
2000	3.6	6.3	4.5
2001	3.8	5.0	4.3
2002	3.5	4.7	4.1

(1) No data available (not required prior to 1985).
(2) TLD locations initiated in 1985 as required by the new Technical Specifications. TLD's included are numbers 96, 58, 97, 56, 15, and 98.
(3) TLD locations include critical residences and populated areas near the site.

TABLE 7-19

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (On-Site Indicator) (2)

	DOSE (mrem per standard month)		
YEAR	MIN	MAX	MEAN
Preop	(1)	(1)	(1)
1970	4.7	9.0	6.0
1971	1.5	7.7	4.7
1972	2.3	8.2	4.9
1973	3.0	24.4	6.6
1974	3.1	10.6	5.7
1975	4.6	16.0	7.3
1976	3.7	18.8	6.9
1977	3.0	15.3	5.7
1978	3.0	9.0	4.3
1979	2.7	8.3	4.3
1980	3.9	12.0	5.3
1981	4.1	11.8	5.8
1982	3.9	13.0	6.3
1983	5.0	16.5	6.9
1984	4.6	13.2	7.0
1985	4.7	15.9	6.3
1986	4.7	16.1	7.0
1987	4.0	11.4	5.8
1988	4.4	11.9	6.0
1989	2.7	14.5	6.0
1990	3.6	12.9	5.5
1991	3.2	11.6	5.1
1992	3.2	5.6	4.3
1993	3.1	13.6	5.2
1994	2.8	14.3	5.1
1995	3.5	28.6	6.2
1996	3.1	32.6	6.4
1997	3.5	28.8	7.7
1998	3.6	28.8	6.2
1999	3.3	28.4	6.6
2000	3.7	16.5	5.6
2001	3.8	14.5	5.6
2002	3.5	13.6	5.3

(1) No data available.
(2) Includes TLD numbers 3, 4, 5, 6, and 7 (1970 - 1973). Includes TLD numbers 3, 4, 5, 6, 7, 23, 24, 25, and 26 (1974 - 2002). Locations are existing or previous on-site environmental air monitoring locations.

TABLE 7-20

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (Off-Site Indicator) [2]

	DOSE (mrem per standard month)		
YEAR	MIN	MAX	MEAN
Preop	(1)	(1)	(1)
1970	5.0	8.0	6.7
1971	1.1	7.7	4.5
1972	1.8	6.6	4.4
1973	2.2	6.9	4.1
1974	2.4	8.9	5.3
1975	4.5	7.1	5.5
1976	3.4	7.2	5.2
1977	3.7	8.0	5.3
1978	2.7	4.7	3.7
1979	3.0	5.7	4.0
1980	3.1	5.8	4.6
1981	3.6	5.9	4.7
1982	4.0	6.2	5.2
1983	4.6	7.2	5.6
1984	4.6	8.2	6.1
1985	4.6	7.7	5.5
1986	5.0	7.6	6.1
1987	4.4	6.6	5.2
1988	4.2	6.6	5.4
1989	2.8	6.4	4.6
1990	3.8	6.0	4.8
1991	3.4	5.4	4.3
1992	3.1	5.2	4.1
1993	3.2	5.6	4.3
1994	3.0	5.0	4.1
1995	3.9	5.7	4.4
1996	3.3	5.5	4.1
1997	3.7	6.2	4.7
1998	3.9	5.6	4.4
1999	3.8	7.1	4.6
2000	3.8	7.3	4.6
2001	3.7	5.9	4.5
2002	3.6	5.5	4.4

(1) No data available.
(2) Includes TLD numbers 8, 9, 10, 11, 12, and 13 (off-site environmental air monitoring locations).

TABLE 7-21

HISTORICAL ENVIRONMENTAL SAMPLE DATA
MILK (CONTROL) [2]

	Cs-137 (pCi/liter)			I-131 (pCi/liter)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1976	(1)	(1)	(1)	(1)	(1)	(1)
1977	(1)	(1)	(1)	(1)	(1)	(1)
1978	2.4	7.8	5.8	LLD	LLD	LLD
1979	LLD	LLD	LLD	LLD	LLD	LLD
1980	3.6	5.6	4.5	1.4	1.4	1.4
1981	3.9	3.9	3.9	LLD	LLD	LLD
1982	LLD	LLD	LLD	LLD	LLD	LLD
1983	LLD	LLD	LLD	LLD	LLD	LLD
1984	LLD	LLD	LLD	LLD	LLD	LLD
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	5.3	12.4	8.4	0.8	29.0	13.6
1987	LLD	LLD	LLD	LLD	LLD	LLD
1988	LLD	LLD	LLD	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) No data available (samples not required).
(2) Location used was an available milk sample location in a least prevalent wind direction greater than ten miles from the site.

TABLE 7-22

HISTORICAL ENVIRONMENTAL SAMPLE DATA
MILK (INDICATOR) (1)

	Cs-137 (pCi/liter)			I-131 (pCi/liter)		
YEAR	MIN	MAX	MEAN	MIN	MAX	MEAN
1976	4.0	15.0	9.3	0.02	45.00	3.20
1977	11.0	22.0	17.1	0.01	49.00	6.88
1978	3.4	33.0	9.9	0.19	0.19	0.19
1979	3.2	53.0	9.4	LLD	LLD	LLD
1980	3.2	21.0	8.1	0.3	8.8	3.8
1981	3.5	29.0	8.6	LLD	LLD	LLD
1982	3.5	14.0	5.7	LLD	LLD	LLD
1983	3.3	10.9	7.2	LLD	LLD	LLD
1984	LLD	LLD	LLD	LLD	LLD	LLD
1985	LLD	LLD	LLD	LLD	LLD	LLD
1986	6.1	11.1	8.6	0.3	30.0	5.2
1987	5.5	8.1	6.8	LLD	LLD	LLD
1988	10.0	10.0	10.0	LLD	LLD	LLD
1989	LLD	LLD	LLD	LLD	LLD	LLD
1990	LLD	LLD	LLD	LLD	LLD	LLD
1991	LLD	LLD	LLD	LLD	LLD	LLD
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	0.50	0.50	0.50
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD

(1) Locations sampled were available downwind locations within ten miles with high radionuclide deposition potential.

TABLE 7-23

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FOOD PRODUCTS (CONTROL) [2]

	Cs-137 (pCi/g (wet))		
YEAR	MIN.	MAX.	MEAN
1976	(1)	(1)	(1)
1977	(1)	(1)	(1)
1978	(1)	(1)	(1)
1979	(1)	(1)	(1)
1980 (3)	0.02	0.02	0.02
1981	LLD	LLD	LLD
1982	LLD	LLD	LLD
1983	LLD	LLD	LLD
1984	LLD	LLD	LLD
1985 (4)	LLD	LLD	LLD
1986	LLD	LLD	LLD
1987	LLD	LLD	LLD
1988	LLD	LLD	LLD
1989	LLD	LLD	LLD
1990	LLD	LLD	LLD
1991	LLD	LLD	LLD
1992	LLD	LLD	LLD
1993	0.007	0.007	0.007
1994	LLD	LLD	LLD
1995	LLD	LLD	LLD
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	LLD	LLD	LLD
1999	LLD	LLD	LLD
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD

(1) No data available (control samples not required).
(2) Location was an available food product sample location in a least prevalent wind direction greater than ten miles from the site.
(3) Data comprised of broadleaf and non-broadleaf vegetation (1980 - 1984).
(4) Data comprised of broadleaf vegetation only (1985 - 2002).

TABLE 7-24

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FOOD PRODUCTS (INDICATOR) [1]

	Cs-137 (pCi/g (wet))		
YEAR	MIN	MAX	MEAN
1976 (2)	LLD	LLD	LLD
1977	LLD	LLD	LLD
1978	LLD	LLD	LLD
1979	0.004	0.004	0.004
1980	0.004	0.060	0.036
1981	LLD	LLD	LLD
1982	LLD	LLD	LLD
1983	LLD	LLD	LLD
1984	LLD	LLD	LLD
1985 (3)	0.047	0.047	0.047
1986	LLD	LLD	LLD
1987	LLD	LLD	LLD
1988	0.008	0.008	0.008
1989	0.009	0.009	0.009
1990	LLD	LLD	LLD
1991	0.040	0.040	0.040
1992	LLD	LLD	LLD
1993	LLD	LLD	LLD
1994	0.004	0.011	0.008
1995	0.010	0.012	0.011
1996	LLD	LLD	LLD
1997	0.012	0.012	0.012
1998	LLD	LLD	LLD
1999	0.008	0.008	0.008
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD

(1) Indicator locations were available downwind locations within ten miles of the site and with high radionuclide deposition potential.
(2) Data comprised of broadleaf and non-broadleaf vegetation (1976 - 1984).
(3) Data comprised of broadleaf vegetation only (1985 - 2002).

SECTION 8.0

QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

8.0 QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

8.1 PROGRAM DESCRIPTION

The Nine Mile Point Unit 1 (NMP1) Offsite Dose Calculation Manual (ODCM), Part 1, Section DSR 4.6.21 and the Nine Mile Point Unit 2 (NMP2) ODCM, Part 1, Section D 3.5.3 requires that the licensee participate in an Interlaboratory Comparison Program. The Interlaboratory Comparison Program shall include sample media for which samples are routinely collected and for which Comparison samples are commercially available. Participation in an Interlaboratory Comparison Program ensures that independent checks on the precision and accuracy of the measurement of radioactive material in the environmental samples are performed as part of the Quality Assurance Program for environmental monitoring. To fulfill the ODCM requirement for an Interlaboratory Comparison Program, the James A. Fitzpatrick Nuclear Power Plant (JAFNPP) Environmental Laboratory has engaged the services of two independent laboratories to provide quality assurance comparison samples. The two laboratories are Analytics, Incorporated in Atlanta, Georgia and the U.S. Department of Energy's Environmental Measurements Laboratory (EML) in New York City.

Analytics supplies requested sample media as blind sample spikes, which contain certified levels of radioactivity unknown to the analysis laboratory. These samples are prepared and analyzed using standard laboratory procedures. The results are submitted to Analytics, which issues a statistical summary report. The JAFNPP Environmental Laboratory uses predetermined acceptance criteria methodology for evaluating the laboratory's performance for Analytics' sample results.

In addition to the Analytics Program, the JAFNPP Environmental Laboratory participated in the Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP). EML supplies sample media as blind sample spikes to approximately 127 laboratories worldwide. These samples, containing a spiked amount of low level activity, are analyzed using standard laboratory procedures. The results are submitted to the Environmental Measurements Laboratory for statistical evaluation. Reports are provided to each participating laboratory, which provide an evaluation of the laboratory's performance.

During 2002, tritium analyses for the JAF Environmental Laboratory were performed by Framatome, ANP.

8.2 PROGRAM SCHEDULE

SAMPLE MEDIA	LABORATORY ANALYSIS	SAMPLE PROVIDER ANALYTICS	EML	YEARLY TOTAL
Water	Gross Beta	0	2	2
Water	Tritium	1	2	3
Water	I-131	2	0	2
Water	Mixed Gamma	2	2	4
Air	Gross Beta	2	2	4
Air	I-131	2	0	2
Air	Mixed Gamma	2	2	4
Milk	I-131	2	0	2
Milk	Mixed Gamma	2	0	2
Soil	Mixed Gamma	1	0	1
Vegetation	Mixed Gamma	1	0	1
TOTAL SAMPLE INVENTORY		17	10	27

8.3 ACCEPTANCE CRITERIA

Each sample result is evaluated to determine the accuracy and precision of the laboratory's analysis result. The evaluation method for the QA sample results is dependent on the supplier of the sample. The sample evaluation methods are discussed below.

8.3.1 ANALYTICS SAMPLE RESULTS

Samples provided by Analytics are evaluated using what is specified as the NRC method. This method is based on the calculation of the ratio of results reported by the participating laboratory (QC result) to the Vendor Laboratory Known value (reference result).

An Environmental Laboratory analytical result is evaluated using the following calculation:

The value for the error resolution is calculated.

$$\text{The error resolution} = \frac{\text{Reference Result}}{\text{Reference Result's Error}}$$

Using the appropriate row under the Error Resolution column in Table 8.3.1 below, a corresponding Ratio of Agreement interval is given.

The value for the ratio is then calculated.

$$\text{Ratio of Agreement} = \frac{\text{QC Result}}{\text{Reference Result}}$$

If the value falls within the agreement interval, the result is acceptable.

TABLE 8.3.1

ERROR RESOLUTION	RATIO OF AGREEMENT
≤3	0.4-2.5
3.1 to 7.5	0.5-2.0
7.6 to 15.5	0.6-1.66
15.6 to 50.5	0.75-1.33
50.6 to 200	0.8-1.25
>200	0.85-1.18

Again, this acceptance test is generally referred to as the "NRC" method. The acceptance criteria is contained in Procedure DVP-04.01 and was taken from the Criteria of Comparing Analytical Results (USNRC) and Bevington, P.R., Data Reduction and Error Analysis for the Physical Sciences, McGraw-Hill, New York, (1969). The NRC method generally results in an acceptance range of approximately ± 25% of the Known value when applied to sample results from the Analytics Inc. Interlaboratory Comparison Program. This method is used as the procedurally required assessment method and requires the generation of a nonconformity report when results are unacceptable.

8.3.2 ENVIRONMENTAL MEASUREMENTS LABORATORY (EML)

The laboratory's analytical performance is evaluated by EML based on the historical analytical capabilities for individual analyte/matrix pairs. The statistical criteria for Acceptable Performance, "A", has been chosen by EML to be between the 15th and 85th percentile of the cumulative normalized distribution, which can be viewed as the middle 70% of all historic measurements. The Acceptable With Warning criteria, "W", is between the 5th and 15th percentile and between the 85th and 95th percentile. In other words, the middle 70% of all reported values are acceptable, while the other 5th-15th (10%) and 85th-95th percentiles (10%) are in the warning area. The Not Acceptable criteria, "N", is

established at less than the 5th percentile and greater than the 95th percentile, that is, the outer 10% of the historical data. Using five years of historical analytical data, the EML determined performance results using the percentile criteria summarized below:

Result	Cumulative Normalized Distribution
Acceptable ("A")	15% - 85%
Acceptable with Warning ("W")	5% - 15% or 85% - 95%
Not Acceptable ("N")	<5% or >95%

8.4 PROGRAM RESULTS SUMMARY

The Interlaboratory Comparison Program numerical results are provided on Table 8-1.

8.4.1 ANALYTICS QA SAMPLES RESULTS

Seventeen QA blind spike samples were analyzed as part of Analytics 2002 Interlaboratory Comparison Program. The following sample media were evaluated as part of the comparison program.

- Air Charcoal Cartridge, I-131
- Air Particulate Filter, Mixed Gamma Emitters/Gross Beta
- Water, I-131/Mixed Gamma Emitters/Tritium
- Soil, Mixed Gamma Emitters
- Milk, I-131 Mixed Gamma Emitters
- Vegetation, Mixed Gamma Emitters

The JAF Environmental Laboratory performed 79 individual analyses on the seventeen QA samples. Of the 79 analyses performed, 77 were in agreement using the NRC acceptance criteria for a 97.5% agreement ratio.

Sample non-conformities are discussed in Section 8.4.1.1.

8.4.1.1 ANALYTICS SAMPLE NONCONFORMITIES

A. Analytics Sample E-3286-05, Cr-51 in Milk Nonconformity No. 02-09

A spiked mixed gamma in milk sample supplied by Analytics, Inc., was analyzed in accordance with standard laboratory procedures. The sample contained a total of nine radionuclides for analysis. Nine of the nine radionuclides present were quantified. Eight of the nine radionuclides were quantified within the acceptable range. The results for Cr-51 were determined to be outside the QA Acceptance Criteria. The milk sample was analyzed on three different detectors with the mean Cr-51 results reported as 176.7 pCi/l. The known results for the sample was 227 pCi/l as determined by the supplier.

An evaluation of the Cr-51 result was performed. The spectrum and peak search results were examined with no abnormalities identified. Cr-51 decays by electron capture with a 27.7 day half-life and a gamma ray energy of 320 KeV with a yield of 9.8%. No secondary gamma energies are produced in the Cr-51 decay scheme. This low gamma energy yield and short half-life will result in very low net counts for samples containing environmental levels of Cr-51. The average net count rate of the three analyses ranged from a high of 1.9 counts per minute to a low of 0.68 counts per minute. One of the three reported results was 244 pCi/l and resulted in an agreement when compared to the known of 227 with a ratio of 1.07. This result had an associated counting error of 13.1%. The remaining two counts had ratios of 0.55 and 0.71 with high associated counting errors of 29.3% and 21.2% respectively.

The combination of the following; low sample activity, very small net count rate, short half-life, low gamma energy, and small gamma yield, resulted in an inaccurate sample result. The wide range of the associated counting errors demonstrates the low confidence level in the reported results. The poor analytical results for this sample are not routine and do not indicate a programmatic deficiency in the analysis of Cr-51 in milk samples or other environmental media. Confidence in the accurate analysis of Cr-51 can be demonstrated by other Cr-51 analytical results, both in the sample results for the 2002 QA program and historical Cr-51 QA results. The Cr-51 results for the

other Quality Assurance samples analyzed as part of the 2002 Interlaboratory Comparison Program were all acceptable and are summarized below:

2002 Cr-51 Results

Sample ID	Medium	JAF	Reference	Ratio
			Reference	
E-3051-05	WATER pCi/liter	234±20	198±10	1.18
E-3284-05	WATER pCi/liter	324±23	304±15	1.07
E-3052-05	FILTER pCi/filter	187±13	203±10	0.92
E-3285-05	FILTER pCi/filter	157±13	141±7	1.11
E-3215-05	MILK pCi/liter	239±19	235±12	1.02
E-3218-05	VEGETATION pCi/kg	408±23	403±20	1.01
E-3216-05	SOIL pCi/kg	370±75	318±16	1.16
			Mean Ratio =	1.07

A review of historical QA data for 2001 was also performed to determine if this is a recurring systematic error or bias. In 2001, eleven QA samples were analyzed which contained Cr-51. The mean ratio for these samples relative to the known (reference) value is 98.5. There were two Cr-51 nonconformities in the 2001 Interlaboratory Comparison Program and were determined not to be systematic or programmatic errors. The historic Cr-51 nonconformities were a low percentage of the overall gamma spectroscopy QA program and have been determined to be the result of the low sample activity and low gamma yields for Cr-51 in the spiked samples. Analytical methods and system calibrations are not the cause of this nonconformity, based on the accurate results achieved for the analysis of the other eight radionuclides present in the sample. No corrective actions were implemented as a result of this nonconformity.

B. Filter Analytics Sample E-3285-05
Nonconformity No. 02-08, Air Particulate Gamma Emitters

The gamma spectral analysis of sample E-3285-05 resulted in the quantification of nine radionuclides. Results for eight of the identified radionuclides were in agreement with the reference value and one measurement was in disagreement. The Fe-59 results had a calculated ratio of 1.29, which places the results outside the acceptable limit. The sample ratio of 1.29 demonstrates that the Fe-59 sample result is biased high. An evaluation of the Fe-59 result was performed. Fe-59 concentrations were detected in three of the three analysis reported for this sample. The spectrum and peak search results were examined with no abnormalities identified. Fe-59 decays with a 44.5 day

half-life with two gamma ray energies of 1099 KeV and 1291 KeV with yields of 57% and 43% respectively. Fe-59 concentrations were identified at both the 1099 KeV and 1291 KeV peaks in all three analyses with the following results.

	Concentration pCi/filter		
Detector Number	Peak 1 1099 KeV	Peak 2 1291 KeV	Mean Concentration
1	69.9	79.3	73.5
2	68.5	61.4	65.4
8	74.7	73.0	73.9
Mean pCi/filter	71.0	71.2	70.9
Ratio	1.29	1.30	1.29

There were no significant differences for the activity that was measured at either of the two Fe-59 peaks. The number of total counts measured in both of these peaks may be biased high due to coincidence counting as the result of other radionuclides that are present in the sample. The relatively low gamma yield and low activity of 55 pCi/Kg may have also contributed to the inaccuracy of this sample result.

Fe-59 was measured in seven other samples analyzed as part of the 2002 Interlaboratory Comparison Program. All of these samples were in agreement with the reference laboratory with a mean agreement ratio of 1.09. This mean ratio of greater than 1.09 would indicate that these samples were biased high and the bias was the possible result of coincidence counting from other radionuclides in the sample. The amount of bias experienced in most Interlaboratory Comparison Program samples due to coincidence counting has been limited to less than 20 percent and has resulted in sample results which were statistically acceptable when compared to the reference value. Changes to the radionuclide library were made in 2001 to direct the gamma spectroscopy software to calculate the mean concentration value based on both the 1099 KeV and 1291 KeV peaks. In most gamma spectrums, this has reduced the effect of the coincidence count on the Fe-59 analytical results as the 1291 KeV peak may be less affected by the coincidence counting in multiple radionuclide samples. No corrective actions were implemented as a result of this nonconformity.

8.4.2 ENVIRONMENTAL MEASUREMENTS LABORATORY (EML)

In 2002, JAF Environmental Laboratory participated in both the EML Quality Assessment Programs, QAP-56 and QAP-57. Sample sets consisted of the following sample media:

- Water - Gross Beta/Mixed Gamma Emitters
- Water - Tritium
- Air Particulate Filter - Mixed Gamma Emitters/Gross Beta

A total of 10 samples containing 18 individual radionuclides were evaluated for the samples included in QAP-56 and QAP-57. Using the EML acceptance criteria, 17 of 18 radionuclides analyses (94.4%) were evaluated to be acceptable. Results for the EML cross Check Program can be viewed on-line at www.eml.doe.gov. A summary of the JAF Environmental Laboratory results is as follows:

Matrix	Total Analyses	Acceptable	Not Acceptable
Air	10	10	0
Water	8	7	1
Total	18	17	1
Percentage		94.4%	5.6%

8.4.2.1 EML SAMPLE NONCONFORMITIES

A. EML Sample QAP-56, Cs-134 in Water Nonconformity No. 02-02

The QAP-56 gamma in water sample contained three radionuclides for evaluation; Cs-137, Cs-134 and Co-60. Two of the three radionuclides present, Co-60 and Cs-137, were quantified with agreement ratios of 1.02 and 0.99, respectively. The JAF laboratory reported a Cs-134 result of 2.6 ± 0.5 Bq/L (70.3 pCi/l). The EML known activity was reported as 3.357 Bq/L (90.74 pCi/L). The agreement ratio for the Cs-134 analysis was 0.77, which placed the result outside the acceptable range. The cause of the nonconformity is attributed to several factors. The concentration of Cs-134 in the sample was very small at 3.36 Bq/L and resulted in a one sigma counting error of approximately 20%. By comparison, the one sigma counting errors for the Co-60 result was 1.0% and the one sigma counting error for the Cs-137 result was 1.3%. The high associated counting error was the result of the low count rate

measured for the Cs-134 peak and resulted in poor counting statistics. The measurement of the Cs-134 concentration in this sample was further complicated by the presence of an interference peak at 609 KeV. The combination of the low concentration and interference from 609 KeV peak were both contributing factors in the non-conforming result. A review of the EML summary statistics for this sample showed a relatively high failure or nonconformity rate for other laboratories participating in this sample comparison. Their statistics are as follows:

EML Summary QAP-56
Cs-134 in Water

Isotope	No. Labs Reporting	% in Agreement	% with Warning	% not in Agreement
Cs-134	116	60.3	23.3	16.40
Cs-137	146	87.0	11.0	2.10

As the table shows for the 116 laboratories reporting results, only 60.3% were in agreement with the known value. 16.4% of the participating laboratories were not in agreement and 23.3% of laboratories reporting results were in the warning range for the reported results. An additional 30 laboratories reported no results for the Cs-134 concentration. By comparison, the statistics for the Cs-137 concentration showed a failure rate of only 2.1% and acceptable results for 87% of the results reported for the study.

The Cs-134 results reported for the 2002 QAP-57 study, conducted in the second half of the year, were acceptable with an agreement ratio of 1.0. Cs-134 was measured in nine other comparison samples analyzed as part of the 2002 Interlaboratory Comparison Program. The mean ratio for all the reported results was 0.96 and there were no nonconformities. These results demonstrate that there is no programmatic or systematic error inherent to the analyses of Cs-134 in environmental sample medium. No corrective action was implemented as a result of this nonconformity.

TABLE 8-1
INTERLABORATORY INTERCOMPARISON PROGRAM
Gross Beta Analysis of Air Particulate Filters(pCi/filter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
6/13/02	E-3214-05	AIR pCi/filter	GROSS BETA	27.5±1.3 24.8±1.3 25.9±1.3 Mean = 26.1±0.8	25±1	1.04, A
12/5/02	E-3467-05	AIR pCi/filter	GROSS BETA	114.7±1.2 114.3±1.2 113.1±1.2 Mean = 114.0±0.7	127±6	0.90, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Tritium Analysis of Water (pCi/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
03/14/02	E-3050-05	WATER pCi/liter	H-3	10080±140 9880±140 10130±140 Mean = 10030±81	10026±501	1.0, A

(1) Results reported as activity ± 1 sigma. Sample Analyzed by Framatome, ANP
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Samples provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Iodine Analysis of Water, Air and Milk

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
03/14/02	E-3051-05	WATER pCi/liter	I-131**	58.5±1.6 57.6±1.8 60.9±1.2 Mean = 59.0±0.9	61±3	0.97, A
06/13/02	E-3217-05	AIR pCi/cc	I-131	80.2±7.4 104.0±8.1 112.0±8.5 Mean = 98.7±4.6	93±5	1.06, A
06/13/02	E-3215-05	MILK pCi/liter	I-131**	75.8±1.0 80.4±1.2 76.8±1.3 Mean = 77.7±0.7	87±4	0.90, A
09/12/02	E-3287-05	AIR pCi/cc	I-131	84.4±7.1 78.8±8.8 83.2±7.0 Mean = 82.4±4.4	81±4	1.01, A
09/12/02	E-3284-05	WATER pCi/liter	I-131**	76.8±1.2 72.6±1.2 75.3±1.1 Mean = 74.9±0.7	79±4	0.95, A
09/12/02	E-3286-05	MILK pCi/liter	I-131**	69.8±1.5 73.8±1.3 72.1±1.5 Mean = 71.9±0.8	80±4	0.90, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Samples provided by Analytics, Inc.
(**) Result determined by Resin Extraction/Gamma Spectral Analysis.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Water (pCi/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
03/14/02	E-3051-05	WATER pCi/liter	Ce-141	248.0±9.5 251.0±8.3 249.0±8.3 Mean = 249.0±5.0	242±12	1.03, A
			Cr-51	222.0±35.5 249.0±35.6 232.0±33.4 Mean = 234.3±20.1	198±10	1.18, A
			Cs-134	80.8±5.1 82.6±4.3 79.1±4.3 Mean = 80.8±2.6	91±5	0.89, A
			Cs-137	184.0±6.6 183.0±6.4 191.0±6.4 Mean = 186.0±3.7	197±10	0.94, A
			Mn-54	183.0±6.8 172.0±6.4 185.0±6.4 Mean = 180.0±3.8	166±8	1.08, A
			Fe-59	91.4±7.0 110.0±6.7 89.8±6.1 Mean = 97.1±3.8	86±4	1.13, A
			Zn-65	160.0±11.1 182.0±9.9 167.0±10.6 Mean = 169.7±6.1	164±8	1.04, A
			Co-60	109.0±4.3 124.0±4.3 110.0±4.0 Mean = 114.3±2.4	117±6	0.97, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Water (pCi/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
09/19/02	E-3284-05	WATER pCi/liter	Ce-141	230.0±9.3 221.0±7.6 224.0±9.7 Mean = 225.0±5.1	214±11	1.05, A
			Cr-51	321.0±38.1 264.0±34.9 389.0±46.1 Mean = 324.7±23.1	304±15	1.07, A
			Cs-134	172.0±6.9 171.0±6.4 167.0±7.9 Mean = 170.0±4.1	176±9	0.97, A
			Cs-137	150.0±6.4 171.0±6.2 174.0±7.9 Mean = 165.0±4.0	169±8	0.98, A
			Mn-54	208.0±7.1 217.0±7.2 232.0±9.1 Mean = 219.0±4.5	204±10	1.07, A
			Fe-59	120.0±7.0 133.0±7.1 127.0±8.8 Mean = 126.7±4.5	119±6	1.07, A
			Zn-65	271.0±13.1 272.0±12.8 242.0±15.9 Mean = 261.7±8.1	251±13	1.04, A
			Co-60	191.0±5.3 185.0±5.3 191.0±6.6 Mean = 189.0±3.3	199±10	0.95, A
			Co-58	130.0±6.2 139.0±6.1 130.0±8.0 Mean = 133.0±3.9	130±7	1.02, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Air Particulate Filters (pCi/filter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
03/14/02	E-3052-05	FILTER pCi/filter	Ce-141	236.0±5.8 226.0±5.6 236.0±6.5 Mean = 232.0±3.5	248±12	0.94, A
			Cr-51	186.0±22.2 217.0±22.3 158.0±24.2 Mean = 187.0±13.2	203±10	0.92, A
			Cs-134	75.7±4.7 93.5±4.9 80.5±5.7 Mean = 83.2±2.9	93±5	0.89, A
			Cs-137	205.0±6.4 204.0±6.4 193.0±7.3 Mean = 200.7±3.9	202±10	1.00, A
			Mn-54	175.0±6.3 178.0±6.5 178.0±7.6 Mean = 177.0±4.0	170±9	1.04, A
			Fe-59	93.9±6.5 98.9±6.9 101.0±7.9 Mean = 97.9±4.1	88±4	1.11, A
			Zn-65	178.0±11.1 169.0±11.2 167.0±12.9 Mean = 171.3±6.8	168±8	1.02, A
			Co-60	113.0±4.3 120.0±4.6 121.0±5.3 Mean = 118.0±2.7	120±6	0.98, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Air Particulate Filters (pCi/filter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
09/20/02	E-3285-05	FILTER pCi/filter	Ce-141	109.0±4.2 104.0±4.3 109.0±4.1 Mean = 107.3±2.4	99±5	1.08, A
			Cr-51	159.0±21.4 175.0±22.5 137.0±21.3 Mean = 157.0±12.6	141±7	1.11, A
			Cs-134	82.8±5.0 82.6±5.2 87.5±4.9 Mean = 84.3±2.9	82±4	1.02, A
			Cs-137	92.2±4.7 91.2±5.0 91.2±4.6 Mean = 91.5±2.8	79±4	1.16, A
			Mn-54	114.0±5.6 116.0±5.8 112.0±5.4 Mean = 114.0±3.2	95±5	1.20, A
			Fe-59	73.5±6.0 65.4±6.5 73.9±5.9 Mean = 70.9±3.5	55±3	1.29, D NC-02-08
			Zn-65	140.0±10.2 143.0±10.8 153.0±10.4 Mean = 145.3±6.0	117±6	1.24, A
			Co-60	91.2±4.1 98.0±4.3 99.4±4.2 Mean = 96.2±2.4	92±5	1.04, A
			Co-58	76.0±4.7 72.0±4.9 65.7±4.4 Mean = 71.2±2.7	60±3	1.18, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.
(D) Evaluation Results Disagreement.
(NC) Nonconformity Report Number.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Milk (pCi/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
06/13/02	E-3215-05	MILK pCi/liter	Ce-141	92.2±7.2 93.5±5.9 82.7±6.7 Mean = 89.5±3.8	90±5	1.00, A
			Cr-51	230.0±33.5 206.0±30.6 282.0±32.8 Mean = 239.3±18.7	235±12	1.02, A
			Cs-134	111.0±5.4 112.0±5.3 115.0±5.1 Mean = 112.7±3.0	120±6	0.94, A
			Cs-137	93.9±5.1 88.0±4.8 87.5±5.1 Mean = 89.8±2.9	91±5	0.99, A
			Mn-54	98.8±5.3 93.1±5.1 103.0±5.3 Mean = 98.3±3.0	95±5	1.03, A
			Fe-59	83.3±6.4 88.8±6.4 84.4±6.7 Mean = 85.5±3.8	81±4	1.06, A
			Zn-65	187.0±11.7 157.0±10.4 192.0±11.7 Mean = 178.7±6.5	180±9	0.99, A
			Co-60	115.0±4.4 124.0±4.4 124.0±4.4 Mean = 121.0±2.5	125±6	0.97, A
			Co-58	92.4±5.6 99.4±5.3 93.8±5.1 Mean = 95.2±3.1	100±5	0.95, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Milk (pCi/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
09/12/02	E-3286-05	MILK pCi/liter	Ce-141	159.0±6.7 153.0±8.6 162.0±7.0 Mean = 158.0±4.3	160±8	0.99, A
			Cr-51	244.0±32.0 125.0±36.6 161.0±34.1 Mean = 176.7±19.8	227±11	0.78, D NC-02-09
			Cs-134	120.0±5.7 118.0±7.0 115.0±5.6 Mean = 117.7±3.5	132±7	0.89, A
			Cs-137	111.0±5.5 129.0±6.9 124.0±5.6 Mean = 121.3±3.5	127±6	0.95, A
			Mn-54	159.0±6.2 146.0±7.6 151.0±6.0 Mean = 152.0±3.8	152±8	1.00, A
			Fe-59	93.7±6.5 102.0±8.4 91.8±6.4 Mean = 95.8±4.1	89±4	1.08, A
			Zn-65	192.0±11.4 179.0±14.9 192.0±11.2 Mean = 187.7±7.3	187±9	1.01, A
			Co-60	143.0±4.8 145.0±6.0 147.0±4.7 Mean = 145.0±3.0	149±7	0.97, A
			Co-58	98.1±5.2 99.4±7.0 104.0±5.4 Mean = 100.5±3.4	97±5	1.04, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.
(D) Evaluation Results, Disagreement.
(NC) Nonconformity Report Number

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Soil (pCi/gram)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
06/13/02	E-3216-05	SOIL pCi/gram	Ce-141	0.114±0.026 0.186±0.024 0.141±0.022 Mean = 0.147±0.014	0.122±0.006	1.20, A
			Cr-51	0.427±0.142 0.349±0.125 0.334±0.122 Mean = 0.370±0.075	0.318±0.016	1.16, A
			Cs-134	0.158±0.020 0.126±0.020 0.192±0.020 Mean = 0.159±0.012	0.163±0.008	0.98, A
			Cs-137	0.240±0.019 0.214±0.022 0.204±0.020 Mean = 0.219±0.012	0.208±0.010	1.05, A
			Mn-54	0.133±0.015 0.157±0.017 0.132±0.018 Mean = 0.141±0.010	0.129±0.006	1.09, A
			Fe-59	0.107±0.027 0.099±0.029 0.145±0.030 Mean = 0.117±0.016	0.109±0.005	1.07, A
			Zn-65	0.227±0.027 0.292±0.034 0.279±0.034 Mean = 0.266±0.019	0.243±0.012	1.09, A
			Co-60	0.156±0.012 0.165±0.014 0.142±0.013 Mean = 0.154±0.008	0.168±0.008	0.92, A
			Co-58	0.115±0.016 0.114±0.017 0.125±0.017 Mean = 0.118±0.010	0.135±0.007	0.87, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Vegetation (pCi/gram)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (2)	RATIO (3)
06/13/02	E-3218-05	VEGETATION pCi/gram	Ce-141	0.175±0.006 0.161±0.007 0.176±0.008 Mean = 0.171±0.004	0.154±0.008	1.11, A
			Cr-51	0.414±0.038 0.424±0.040 0.385±0.042 Mean = 0.408±0.023	0.403±0.020	1.01, A
			Cs-134	0.227±0.007 0.218±0.007 0.229±0.008 Mean = 0.225±0.004	0.206±0.010	1.09, A
			Cs-137	0.162±0.006 0.154±0.007 0.178±0.007 Mean = 0.165±0.004	0.156±0.008	1.06, A
			Mn-54	0.186±0.007 0.184±0.007 0.193±0.001 Mean = 0.188±0.004	0.163±0.009	1.15, A
			Fe-59	0.154±0.009 0.141±0.009 0.156±0.010 Mean = 0.150±0.006	0.138±0.007	1.09, A
			Zn-65	0.327±0.016 0.343±0.016 0.324±0.017 Mean = 0.331±0.009	0.308±0.015	1.07, A
			Co-60	0.233±0.006 0.229±0.006 0.230±0.006 Mean = 0.231±0.004	0.213±0.011	1.08, A
			Co-58	0.187±0.007 0.183±0.007 0.184±0.008 Mean = 0.185±0.004	0.171±0.009	1.08, A

(1) Results reported as activity ± 1 sigma.
(2) Results reported as activity ± 3 sigma.
(3) Ratio = Reported/Analytics (See Section 8.3).
(*) Sample provided by Analytics, Inc.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Water (Bq/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (1)	RATIO (2)
03/01/02	QAP-56	WATER Bq/liter	Cs-134	2.5±1.0 2.4±0.8 3.0±0.6 2.7±1.1 2.3±1.4 Mean = 2.6±0.5	3.4±0.2	0.77, D NC-02-02
			Cs-137	57.1±1.8 52.9±1.7 57.0±1.7 53.7±1.7 55.5±1.9 Mean = 55.7±0.8	56.1±2.9	0.99, A
			Co-60	352.0±3.0 355.9±3.1 353.0±3.0 352.6±3.8 354.5±3.6 Mean = 353.8±1.5	347.3±12.4	1.02, A

(1) Results reported as activity ± 1 sigma.
(2) Ratio = Reported/EML(See Section 8.3).
(*) Sample provided by Environmental Measurements Lab., Dept. of Energy.
(A) Evaluation Results, Acceptable.
(D) Evaluation Results, Disagreement
(NC) Nonconformity Report Number

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Water (Bq/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (1)	RATIO (2)
09/01/02	QAP-57	WATER Bq/liter	Cs-134	62.9±2.2 61.1±2.3 59.9±2.2 57.7±2.7 60.7±1.7 62.2±2.1 Mean = 60.7±0.9	60.2±1.9	1.01, A
			Cs-137	81.0±2.5 77.7±2.5 78.1±2.4 73.3±2.9 77.8±1.8 78.8±2.5 Mean = 77.7±1.0	81.4±4.3	0.95, A
			Co-60	265.7±3.4 271.6±3.6 275.7±3.5 258.6±4.2 268.3±2.5 270.5±3.4 Mean = 268.4±1.4	268.7±9.7	1.00, A

(1) Results reported as activity ± 1 sigma.
(2) Ratio = Reported/EML(See Section 8.3).
(*) Sample provided by Environmental Measurements Lab., Dept. of Energy.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Air Particulate Filters (Bq/filter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (1)	RATIO (2)
03/01/02	QAP-56	FILTER Bq/filter	Co-60	28.4±0.4 29.5±0.4 30.0±0.4 29.6±0.5 29.2±0.4 Mean = 29.3±0.2	30.5±0.7	0.96, A
			Mn-54	40.3±0.6 39.6±0.6 40.0±0.6 40.7±0.7 40.0±0.6 Mean = 40.0±0.3	38.5±0.9	1.04, A
			Cs-137	28.2±0.5 28.0±0.5 27.5±0.5 27.8±0.5 27.8±0.4 Mean = 27.9±0.2	28.2±0.7	0.99, A
09/01/02	QAP-57	FILTER Bq/filter	Mn-54	58.1±1.0 57.7±1.1 58.5±1.0 58.1±1.3 58.5±0.9 57.0±1.0 Mean = 58.0±0.4	52.2±1.2	1.11, A
			Co-60	24.0±0.5 23.5±0.6 22.6±0.5 23.0±0.7 22.4±0.5 22.9±0.5 Mean = 23.1±0.2	23.0±0.1	1.00, A
			Cs-137	33.6±0.7 34.3±0.8 33.8±0.7 34.6±0.9 32.9±0.7 34.2±0.7 Mean = 33.9±0.3	32.5±0.8	1.04, A

(1) Results reported as activity ± 1 sigma.
(2) Ratio = Reported/EML(See Section 8.3).
(*) Sample provided by Environmental Measurements Lab., Dept. of Energy.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gross Beta Analysis of Water (Bq/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (1)	RATIO (2)
03/01/02	QAP-56	WATER Bq/liter	GROSS BETA	1099±17 1125±17 1110±17 Mean = 1111±10	1030±130	1.08, A
09/01/02	QAP-57	WATER Bq/liter	GROSS BETA	782±20 787±20 823±20 Mean = 797±11	900±90	0.89, A

(1) Results reported as activity ± 1 sigma.
(2) Ratio = Reported/EML (See Section 8.3).
(*) Sample provided by Environmental Measurements Lab., Dept. of Energy.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Tritium Analysis of Water (Bq/liter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1&3)	REFERENCE LABORATORY* (1)	RATIO (2)
03/01/02	QAP-56	WATER Bq/liter	H-3	325±5 310±6 313±7 Mean = 316±3	283.7±3.4	1.11, A
09/01/02	QAP-57	WATER Bq/liter	H-3	249±10 241±10 239±10 Mean = 243±6	227.3±5.6	1.07, A

(1) Results reported as activity ± 1 sigma.
(2) Ratio = Reported/EML (See Section 8.3).
(3) Analysis performed by vendor laboratory: Framatome, ANP
(*) Sample provided by Environmental Measurements Lab., Dept. of Energy.
(A) Evaluation Results, Acceptable.

TABLE 8-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gross Beta Analysis of Air (Bq/filter)

DATE	JAF ENV ID NUMBER	MEDIUM	ANALYSIS	JAF RESULT (1)	REFERENCE LABORATORY* (1)	RATIO (2)
03/01/02	QAP-56	AIR Bq/filter	GROSS BETA	1.21±0.003 1.18±0.03 1.21±0.03 Mean = 1.20±0.02	1.30±0.13	0.92, A
09/01/02	QAP-57	AIR Bq/filter	GROSS BETA	0.84±0.03 0.80±0.03 0.85±0.03 Mean = 0.83±0.02	0.87±0.09	0.95, A

(1) Results reported as activity ± 1 sigma.
(2) Ratio = Reported/EML (See Section 8.3).
(*) Sample provided by Environmental Measurements Lab., Dept. of Energy.
(A) Evaluation Results, Acceptable..

8.5 REFERENCES

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